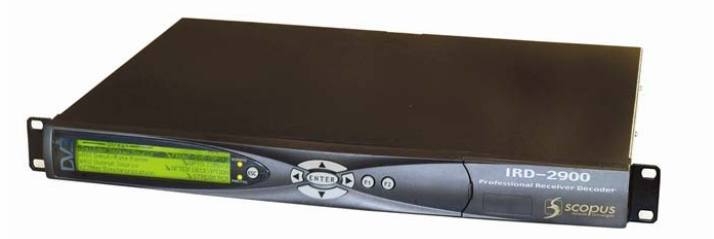
IRD-2900 Series

Professional Integrated Receiver Decoders



USER MANUAL

SCOPUS DOCUMENTS (P/N 100793)
(REV. 2.0 /AUGUST 2005)

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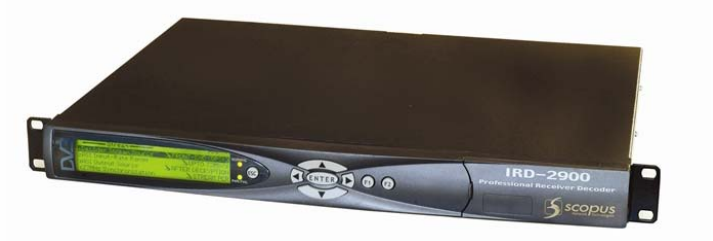
Video Networks

IRD-2900 Series

Professional Integrated Receiver Decoders



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DOCUMENT HISTORY

VERSION	DATE	DETAILS
Rev. 1.0	April 2005	IRD-2900/1.1 software version
Rev. 1.4	June 2005	Adding new features included inSW v1.16
Rev. 2.0	August 2005	Adding new features included inSW v1.18

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The information contained herein is merely descriptive in nature, and does not constitute a binding offer for sale of the product described herein.

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INTRODUCTION

Scopus Video Networks Ltd. takes great pride in delivery of its products and makes every endeavor to ensure its clients full satisfaction.

On behalf of the whole Scopus team, we would like to extend our congratulations on your investment in the IRD-2900 Series of Professional Integrated Receiver Decoders.

MANUAL SCOPE AND STRUCTURE

The IRD-2900 Series Professional Integrated Receiver Decoders User manual is comprised of the following main chapters:

1. **OVERVIEW:**

   This chapter provides the introduction and product description, including: highlights, benefits and typical applications, functional and physical descriptions, and main capabilities and specifications.

2. **INSTALLATION:**

   This chapter provides information and procedures for installation and activation of the unit. The procedures include: site preparation and requirements, installation in a 19" rack, cable connections, rear panel options, pin-out descriptions, initial settings, and serviceability check.

3. **OPERATION:**

   This chapter provides information on unit operation, as well as data and instructions on operating the control and monitoring functions.

4. **APPENDIXES**

   This chapter provides information on software loading and downloading.

TECHNICAL SUPPORT

In case of technical problems with the IRD or one of its components, refer to additional system documentation. Usually, this may assist you to resolve technical difficulties.

Call your local distributor for technical support should you be unable to resolve the problem.

HOW TO RETURN FAULTY PARTS

Before Returning an Item:

- Request an RMA (Return Merchandise Authorization) tracking number from your local distributor.
- Scopus Video Networks Support will assign the number; this must accompany the item being returned and will be referred to in all correspondence.
- Send the item to Scopus Video Networks with the number included in the accompanying documentation (shipping and customs forms).

Customer Support Contact Information

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Warranty

SCOPUS Video Networks Ltd. warrants that the product and any part thereof, including but not limited to spare parts, will, when properly installed, conform to SCOPUS Video Networks Ltd. published specifications and that the product and any parts thereof, including but not limited to spare parts, will be free from defects deriving from faulty workmanship and faulty materials under standard use and service, for a period of twelve (12) months following the date of manufacture thereof.

The supply of spare parts at a reasonable cost shall be available for a period of three (3) years from the date of delivery.

This warranty does not cover ordinary wear and tear of the product or other defects due to circumstances beyond SCOPUS Video Networks Ltd. Control, such as: unsuitable operating means, chemical, Electro-mechanical or electrical influences and damages, which may be caused by interference by the CUSTOMER or any unauthorized third party.

Defective cards and assemblies will be sent to SCOPUS Video Networks Ltd. for repair. The repaired cards and assemblies will be returned to the CUSTOMER within 30 days from their receipt by SCOPUS Video Networks Ltd.

Cards and assemblies repaired during the twelve (12) month warranty period will carry a warranty of six (6) months from date of repair or until the end of original warranty period, whichever is the later date.

SCOPUS Video Networks Ltd. sole liability under this warranty shall be limited to the repair or replacement with equivalent units at SCOPUS Video Networks Ltd. facilities, of any product or parts thereof that do not conform to SCOPUS Video Networks Ltd. published specifications or that are defective in material or workmanship, as specified above. The expense of installing repaired or replaced parts shall be borne by the CUSTOMER.

SCOPUS Video Networks Ltd. sole obligation under this warranty is to be the supplier of the product to the CUSTOMER and to provide such services as set out in this warranty on the SCOPUS Video Networks Ltd. terms and conditions provided for herein. In no event will SCOPUS Video Networks Ltd. be liable to the CUSTOMER for any business expenses, loss of profits, incidental, indirect or consequential damages, however caused, unless such expenses, loss or damages, shall have derived from an infringement of patents of copyrights.

THE WARRANTIES STATED HEREIN ARE EXCLUSIVE AND ARE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Beyond the warranty period, SCOPUS Video Networks Ltd. shall repair or replace defective cards and assemblies according to its standard price list relevant at such time. Cards and assemblies thus repaired shall carry a warranty of six (6) months.

COMPLIANCE	EMC	SAFETY
	EN55022 (CISPR 22)	EN60950
	EN55024 (CISPR 24)	CB (IEC60950)
	EN55013 (CISPR 13)	UL60950
	EN55020 (CISPR 20)	cTUVus
	FCC part 15 (class A)	
	CB	

CE Certification

The IRD-2900 meets all the CE Class A requirements.

In order to meet CE requirements, the following cables must be connected on all ASI outputs (when applicable). When cables are connected to these outputs then the device is compliant with the use of FAIR-RITE 0443164151.

FCC Compliance Notice

Trade Name	Scopus
Product Name	Integrated Receiver Decoder
Product Model Number	IRD-2900 Series

These devices comply with Part 15 of the FCC Rules.

OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

These devices do not cause harmful interference.

These devices must accept any interference received, including interference that may cause undesired operation.

The FCC Wants You to Know

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at his expense.

FCC Warning

Modifications not expressly approved by the manufacturer could void your authority to operate the equipment under FCC Rules.

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Appendix A. Software Download 1

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Chapter 1
OVERVIEW

1.1. GENERAL INFORMATION

The IRD-2900 professional MPEG-2 DVB and ATSC processing platform is designed to meet even most demanding application requirements while maximizing ease of use and flexibility. With a graphical front-panel display, the IRD-2900 Series includes:

- Variety of Telco and cable front-end options
- Dual MPEG-over-IP inputs
- MPEG-over-IP output
- ASI transport-stream input
- SNMP and web based management support

The IRD-2900 Series concurrently decodes up to two video programs and up to four audio channels from the transport stream.

The IRD-2900 Series features the following product lines:

- IRD-296x: Professional single 4:2:0 decoder IRD
- IRD-298x: Professional single 4:2:0/4:2:2 decoder IRD
- IRD-299x: Professional dual 4:2:0 decoders IRD

Housed in a true 1RU slim-line chassis and featuring low power consumption, the IRD fully integrates with the Scopus product platform.

1.2. HIGHLIGHTS AND BENEFITS

The IRD-2900 processing platform's main features and options include:

- Variety of front-end options including DVB-S2 and MPEG-over-IP
- Dual MPEG-over-IP (MPEGoIP) inputs supporting up to 60Mbps (SPTS and MPTS), including link redundancy and logical redundancy
- MPEGoIP output supporting up to 60Mbps with PID dropping and PCR re-stamping
- IP-over-MPEG output up to 60Mbps (MPE decapsulation)
- Up to 4 QPSK L-Band inputs
- ASI transport stream input and output
- DVB common interface (2 slots)
- SDI and AESE/BU as well as analogue outputs
- Up to 4 pairs of audio outputs supporting:
  - Musicam
  - Dolby Digital® AC-3 Pass-through
  - Dolby Digital® AC-3 2.0 Down mixing
  - Linear PCM Audio and Dolby-E Pass-through
- Embedded audio in SDI and re-insertion of VBI
- VBI re-insertion in composite and SDI
- Genlock for high-end accurate frame synchronization required by contribution applications
- Redundancy support, 2 GPI relay contacts
- OSD (On-Screen Display) on 2 video outputs or monitoring outputs only, providing one uninterrupted broadcast for video, and one uninterrupted broadcast for diagnostics and monitoring
- SNMP and web-based management

1.3. APPLICATIONS

The IRD-2900 processing platform is a technologically advanced choice for a wide range of applications. Some typical uses for the IRD-2900 include:

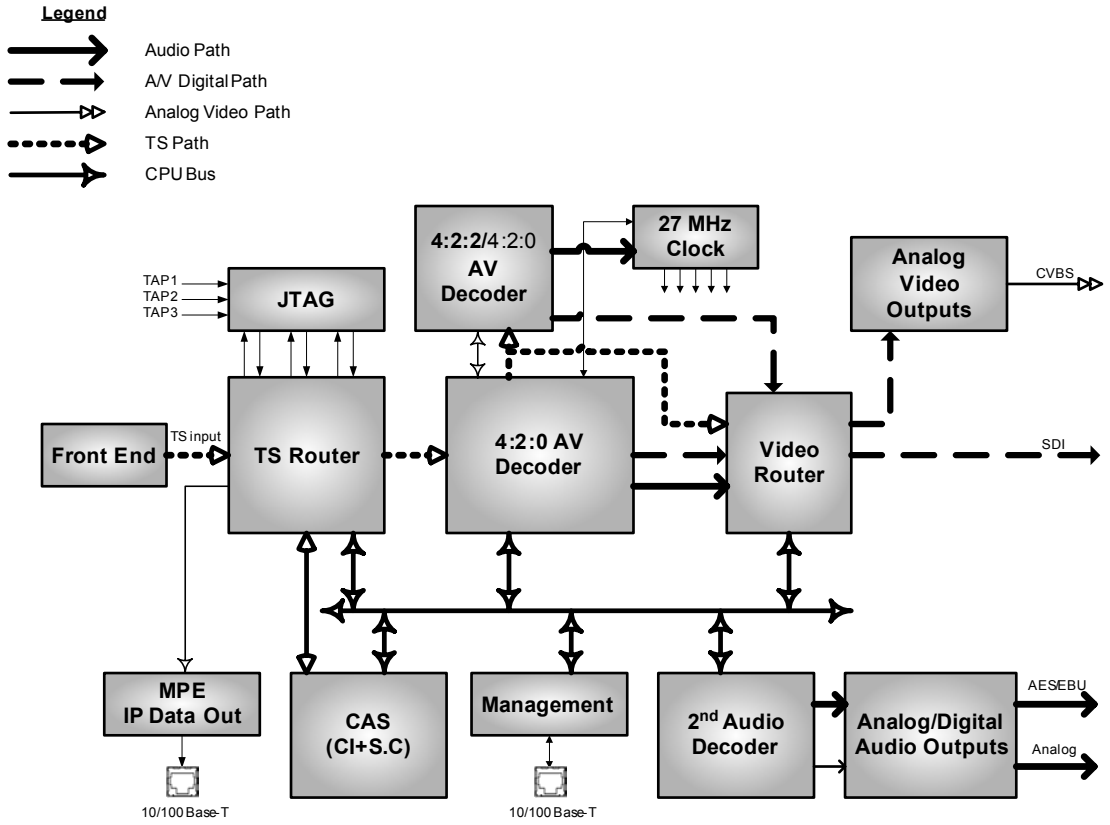
- Digital turnaround
- CATV IP head-end receiver/decoder
- CATV IP distribution edge decoder
- Satellite distribution
- Telco distribution
- DSNG
- Syndication

Scopus offers this series of professional IRDs in a wide range of standard configurations, with the flexibility to select specific interfaces and features required by the application.

1.4. FUNCTIONALITY

The TS Router block receives input streams from one of the available sources, for example: QPSK, MPEG-over-IP IN, ASI IN, and routes the selected input to the Master and Slave decoders. Each decoder decodes one program from the input stream, routed by the TS router block, and provides decoded digital audio and video streams. These streams are provided to the Video Router block that would route them to the relevant outputs as well as to the Analog Video Output. The Analog Video Output receives a Digital Video, converts the digital video into analog video, and outputs the analog video. The Analog and Digital Audio Output component outputs the digital and analog audio.

Figure 1-1: Signal Path in the IRD – Functionality Block Diagram



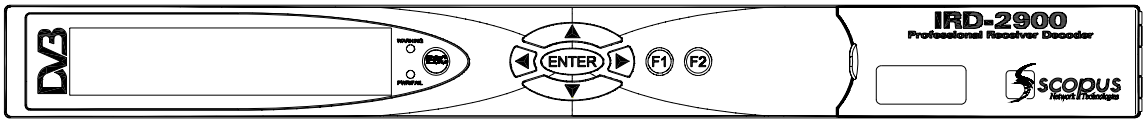
1.5. MECHANICAL STRUCTURE

The IRD is housed in a rugged industrial enclosure, 1RU by 19" (rack mount).

1.5.1. Front Panel

The front panel allows control using a four-way touch pad, an **[Enter]** key, an **[Esc]** key, and two programmable **[F1]**/**[F2]** keys. Operational commands and parameters are displayed on a graphical LCD. The four-way touch pad allows parameter modification and scrolling through the menus of the embedded VBI. Two LEDs show the WARNING and PWR/FAIL status (see Figure 1-2).

Figure 1-2: Front View of the IRD



1.5.2. Model Options

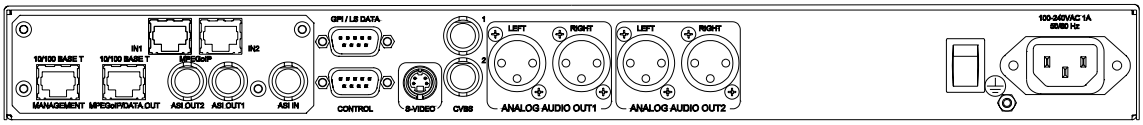
Each IRD model supports the following interfaces:

- DVB-S (QPSK)
- MPEG over IP (MPEGoIP)
- ASI

In this manual all rear panels are shown with the DVB-S interface. Each model has basic-standard features and interfaces as well as features requiring software license to be activated.

The MPEGoIP input interface can be supported in all IRD-2900 devices. Figure 1-3 describes the IRD-2961 rear panel with a MPEGoIP input interface.

Figure 1-3: IRD-2961 Rear Panel (IP Input interface)



NOTE

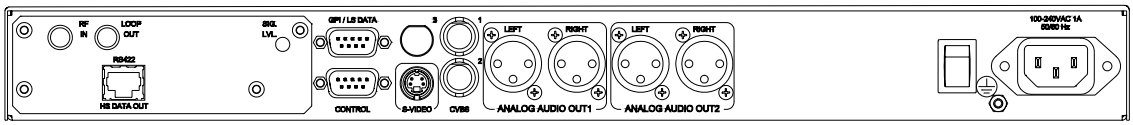
*IRD-2900 models supporting **MPEGoIP** output and IP data out (MPE de-capsulation) output can be configured to support either **MPEGoIP** or IP data out. .*

1.5.2.1. IRD-2960 Interfaces and Features

The IRD-2960 is a single 4:2:0 Decoder IRD. The IRD-296x family consists of two composite video interfaces. The CVBS #1 connector is used for broadcast quality video and the CVBS #2 connector can be used for monitoring.

Figure 1-4 illustrates the IRD-2960 rear panel. The IRD-2960 basic features and software-licensed features are described below.

Figure 1-4: IRD-2960 Rear Panel (Basic Standard)



Basic Features

- 2 composite video interfaces
- 2 analog audio stereo balanced interfaces
- 1st Active analog stereo pair
- RS-232 low speed data
- GPI

Software-Licensed Features

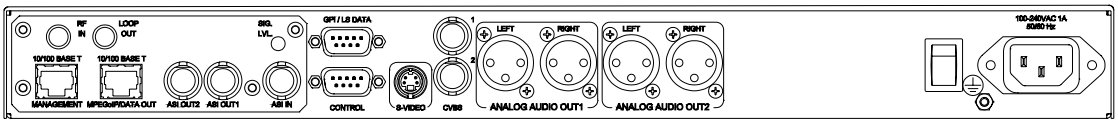
- Russian SECAM D/K (composite video only)
- 2nd Active analog stereo pair
- RS-422 high speed data output
- Dolby digital (AC-3) LT/RT downmixing

1.5.2.2. IRD-2961 Interfaces and Features

The IRD-2961 is a single 4:2:0 decoder IRD. The IRD-296x family consists of two composite video interfaces. The CVBS #1 connector is used for broadcast quality video and the CVBS #2 connector can be used for monitoring.

Figure 1-5 illustrates the IRD-2961 rear panel. The IRD-2961 basic features and software-licensed features are described below.

Figure 1-5: IRD-2961 Rear Panel



Basic Features

- 2 composite video interfaces
- 2 analog audio stereo balanced interfaces
- 1st Active analog stereo pair
- SNMP management (10/100 Base-T)
- Web based management (10/100 Base-T)
- RS-232 low speed data
- GPI

Software-Licensed Features

- ASI input
- Dual ASI output
- MPEG-over-IP output
- IPdata output (MPE de-capsulation)
- Russian SECAM D/K (composite video only)
- 2nd Active analog stereo pair
- Dolby Digital (AC-3) LT/RT downmixing

NOTE

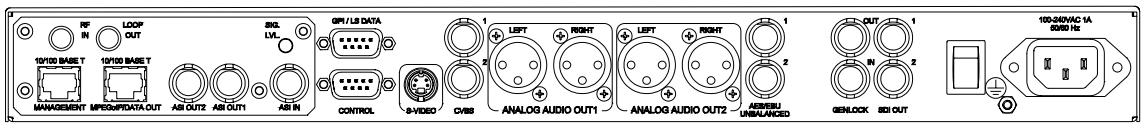
In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of IRD-2900

1.5.2.3. IRD-2962 Interfaces and Features

The IRD-2962 is a single 4:2:0 decoder IRD. All IRD-296x family consists of two composite video interfaces. The CVBS #1 connector is used for broadcast quality video and the CVBS #2 connector can be used for monitoring.

Figure 1-6 illustrates the IRD-2962 rear panel. The IRD-2962 basic features and software-licensed features are described below.

Figure 1-6: IRD-2962 Rear Panel



Basic Features

- 2 composite video interfaces
- 2 SDI interfaces
- Embedded VBI and audio in SDI
- 2 analog-audio-stereo balanced interfaces
- 1st Active analog stereo pair
- 2nd Active analog stereo pair
- 2 AES/EBU-SPDIF audio-unbalanced interfaces
- 1st and 2ND Active AES/EBU-SPDIF
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- RS-232 low speed data
- GPI
- Front panel monitoring connectors

Software-Licensed Features

- ASI input
- Dual ASI outputs
- MPEG-over-IP output
- IP data output

(MPE de-capsulation)

- Genlock input and loop-through output
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E Pass-through

NOTE

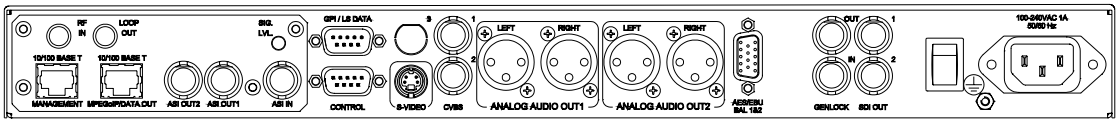
In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of IRD-2900

1.5.2.4. IRD-2963 Interfaces and Features

The IRD-2963 is a single 4:2:0 decoder IRD. All IRD-296X family consists of two composite video interfaces. The CVBS #1 connector is used for broadcast quality video and the CVBS #2 connector can be used for monitoring.

Figure 1-7 illustrates the IRD-2963 rear panel. The IRD-2963 basic features and software-licensed features are described below.

Figure 1-7: IRD-2963 Rear Panel



Basic Features

- 2 composite video interfaces
- 2 SDI interfaces
- Embedded VBI and up to 2 stereo channels in SDI
- 2 analog-audio-stereo balanced interfaces
- 1st Active analog stereo pair
- 2ND Active analog stereo pair
- 2 AES/EBU-SPDIF audio-balanced interfaces
- 1ST and 2ND Active AES/EBU-SPDIF
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- RS-232 low speed data
- GPI
- Front panel monitoring connectors

Software-Licensed Features

- ASI input
- Dual ASI output
- MPEG-over-IP output
- IP data output (MPE de-capsulation)
- Genlock input and loop-through output
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E Pass-through

NOTE

This model requires a breakout cable to connect to the AES/EBU interfaces.

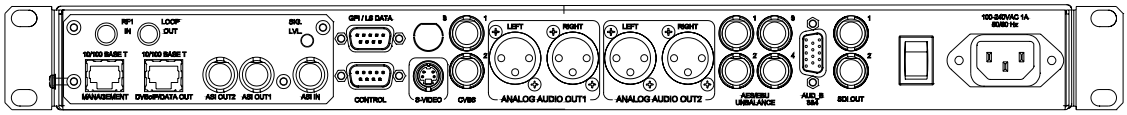
In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of IRD-2900.

1.5.2.5. IRD-2980 Interfaces and Features

The IRD-2980 is a single 4:2:0/4:2:2 decoder IRD. The IRD-298x family consists of two composite video interfaces. Both CVBS #1 and CVBS #2 connectors are for broadcast quality video.

Figure 1-8 illustrates the IRD-2980 rear panel. The IRD-2980 basic features and software-licensed features are described below.

Figure 1-8: IRD-2980 Rear Panel



Basic Features

- 2 composite video interfaces
- 2 SDI interfaces
- Embedded VBI and up to 4 stereo channels in SDI
- Decoding 4:2:2 PP@ML (1.5–50 Mbps)
- 4 analog-audio-stereo balanced interfaces
- 1ST Active analog stereo pair
- 2ND Active analog stereo pair
- 4 AES/EBU-SPDIF audio unbalanced interfaces
- 1ST and 2ND Active AES/EBU-SPDIF
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- RS-232 low speed data
- GPI
- Front panel monitoring connectors

Software-Licensed Features

- ASI input
- Dual ASI output
- MPEG-over-IP output
- IP data output (MPE de-capsulation)
- 3RD Active analog stereo pair
- 4TH Active analog stereo pair
- 3RD Active AES/EBU-SPDIF
- 4TH Active AES/EBU-SPDIF
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E Pass-through

NOTES

This model requires a breakout cable to connect to the 3rd and 4th analog stereo pairs.

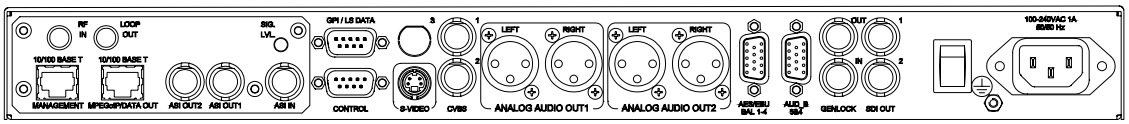
In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of IRD-2900

1.5.2.6. IRD-2981 Interfaces and Features

The IRD-2981 is a single 4:2:2 decoder IRD. The IRD-298x family consists of two composite video interfaces. Both CVBS interfaces are for service broadcast video quality.

Figure 1-9 illustrates the IRD-2981 rear panel. The IRD-2981 basic features and software-licensed features are described below.

Figure 1-9: IRD-2981 Rear Panel



Basic Features

- 2 composite video interfaces
- 2 SDI interfaces
- Embedded VBI and up to 4 stereo channels in SDI
- Decoding 4:2:2 PP@ML (1.5–50 Mbps)
- 4 analog-audio-stereo balanced interfaces
- 1st Active analog stereo pair
- 2nd Active analog stereo pair
- 4 AES/EBU-SPDIF audio-balanced interfaces
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- RS-232 low speed data
- GPI
- Front panel monitoring connectors

Software-Licensed Features

- ASI input
- Dual ASI output
- MPEG-over-IP output
- IP data output (MPE de-capsulation)
- Genlock input and loop-through output
- 3rd Active analog stereo pair
- 4th Active analog stereo pair
- 3rd Active AES/EBU-SPDIF
- 4th Active AES/EBU-SPDIF
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E Pass-through

NOTES

This model requires a breakout cable to connect to the AES/EBU interfaces and to connect to the third and fourth analog stereo pairs.

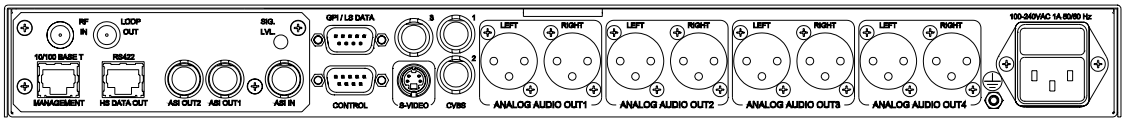
In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of IRD-2900

1.5.2.7. IRD-2990 Interfaces and Features

The IRD-2990 is a dual 4:2:0 decoders IRD. The IRD-299x family consists of three composite video interfaces. The CVBS #1 connector is for a broadcast quality video of decoder #1. The CVBS #2 can be used for monitoring. The CVBS #3 connector is for broadcast quality video of decoder #2.

Figure 1-10 illustrates the IRD-2990 rear panel. The IRD-2990 basic features and software-licensed features are described below.

Figure 1-10: IRD-2990 Rear Panel



Basic Features

- 3 composite video Interfaces
- 4 analog-audio-stereo balanced interfaces
- 1st Active analog stereo pair
- 2nd Active analog stereo pair
- 3rd Active analog stereo pair
- 4th Active analog stereo pair
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- RS-232 low speed data
- GPI

Software Licensed Features

- ASI input
- Dual ASI output
- RS-422 high speed data output
- Russian SECAM D/K (composite video only)
- Dolby Digital (AC-3) LT/RT downmixing

NOTE

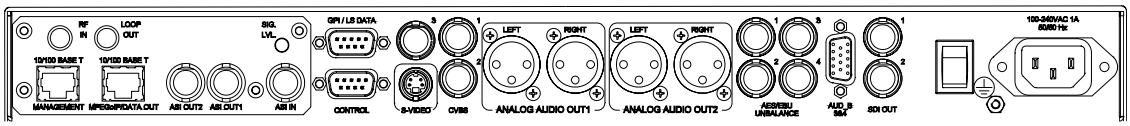
In the case of power failure or system shutdown, ASI OUT 1 output will become as ASI loop-through. Use ASI OUT 1 output for cascading a chain of IRD-2900

1.5.2.8. IRD-2991 Interfaces and Features

The IRD-2991 is a dual 4:2:0 decoders IRD. The IRD-299x family consists of three composite video interfaces. The CVBS #1 connector is for a broadcast quality video of decoder #1. The CVBS #2 can be used for monitoring. The CVBS #3 connector is for broadcast quality video of decoder #2.

Figure 1-11 illustrates the IRD-2991 rear panel. The IRD-2991 basic features and software-licensed features are described below.

Figure 1-11: IRD-2991 Rear Panel



Basic Features

- 3 composite video Interfaces
- 2 SDI interfaces
- Embedded VBI and up to 4 stereo channels in SDI
- 4 analog-audio-stereo balanced interfaces
- 1st Active analog stereo pair
- 2nd Active analog stereo pair
- 3rd Active analog stereo pair
- 4th Active analog stereo pair
- 4 AES/EBU-SPDIF audio unbalanced interface
- 1st and 2nd Active AES/EBU-SPDIF
- 3rd Active AES/EBU-SPDIF
- 4th Active AES/EBU-SPDIF
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- RS-232 low speed data
- GPI

Software-Licensed Features

- ASI input
- Dual ASI output
- MPEG-over-IP output
- IP data output (MPE de-capsulation)
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E Pass-through

NOTES

This model requires a breakout cable to connect to the 3rd and 4th analog stereo pairs.

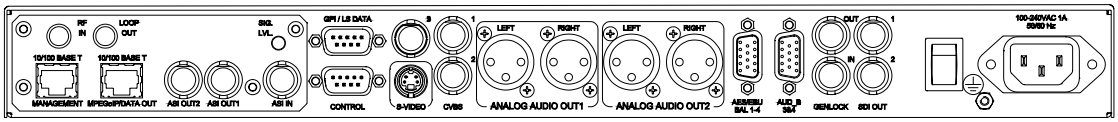
In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of IRD-2900

1.5.2.9. IRD-2992 Interfaces and Features

The IRD-2992 is a dual 4:2:0 decoders IRD. The IRD-299x family consists of three composite video interfaces. The CVBS #1 is for service broadcast video quality. The CVBS #2 is for service monitoring and OSD video quality. The CVBS #3 is for an additional service broadcast video quality.

Figure 1-12 illustrates the IRD-2992 rear panel. The IRD-2992 basic features and software-licensed features are described below.

Figure 1-12: IRD-2992 Rear Panel



Basic Features

- 3 composite video interfaces
- 2 SDI interfaces
- Embedded VBI and up to 4 stereo channels in SDI
- 4 analog-audio-stereo balanced interfaces
- 1st Active analog stereo pair
- 2nd Active analog stereo pair
- 3rd Active analog stereo pair
- 4th Active analog stereo pair
- 4 AES/EBU-SPDIF audio balanced interfaces
- 1st and 2nd Active AES/EBU-SPDIF
- 3rd Active AES/EBU-SPDIF
- 4th Active AES/EBU-SPDIF
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- RS-232 low speed data
- GPI

Software-Licensed Features

- ASI input
- Dual ASI output
- MPEG-over-IP output
- IP data output (MPE de-capsulation)
- Genlock input and loop-through output
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E Pass-through

NOTES

This model requires a breakout cable to connect to the AES/EBU interfaces and to connect to the 3rd and 4th analog stereo pairs

In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of IRD-2900

1.6. MANAGEMENT

1.6.1. Local Management

The IRD-2900 supports local management using the front-panel or a PC terminal control.

1.6.1.1. Front Panel Control

The IRD-2900 front panel provides an easy to use graphical display with a large LCD screen and intuitive control.

1.6.1.2. PC Terminal Control

The IRD-2900 supports PC terminal control from a standard PC terminal (over RS-232 or RS-485). The terminal provides access to control and monitor functions that are not available when using any IRD front panel features.

1.6.2. Remote Management

IRD-2900 supports remote management through NMS-4000, web-based control, or Telnet.

1.6.2.1. NMS-4000 and Future NMS-7000

The NMS-4000 Network Management System enables management of the IRD-2900 via the transmission link. The NMS-4000 provides a menu and dialog-driven interface from which control, modification, and upgrade operations can be performed on the IRD.

1.6.2.2. Web Based Management

IRD-2900 supports web-based management. Managing IRD-2900 parameters using web-based control is as easy as point-and-click.

1.6.2.3. Telnet

The IRD-2900 supports remote control throughout the Internet. The IRD can be controlled and configured from a standard PC terminal (over Ethernet). The terminal provides access to control and monitor functions that are not available when using any IRD front panel features.

1.7. CHARACTERISTICS AND SPECIFICATIONS

1.7.1. Transport Stream Interface Options

FEATURE	SPECIFICATIONS
MPEGoIP INPUT	• TS bit rate: up to 60 Mbps • SPTS/MPTS • UDP, RTP (optional) • Unicast/Multicast • IGMPv2, (IGMPv3 ready) • Network de-Jittering • Pro MPEG de-Jittering • Link redundancy (optional) • Logical (source) redundancy (optional) • Pro-MPEG FEC (optional) • Interface: dual 10/100 Base-T, RJ-45
MPEGoIP OUTPUT	• TS bit rate: up to 60 Mbps • SPTS/MPTS • UDP, RTP (optional) • PID dropping with PCR re-stamping (optional, available in future release) • Pro-MPEG FEC (optional) • Interface: 10/100 Base-T, RJ-45
DVB-S2	• DVB-S2 ready
DVB-S	• Constellation: QPSK • Frequency range: 950-2150 MHz • Symbol rate range: 1-45M Sym/s • L-Band RF input with LNB control and loop-through output • Up to 4 L-band inputs

DVB-DSNG	• Constellations: QPSK, 8PSK and 16QAM • Frequency range: 950-2150 MHz • Symbol rate range: 1-45 Msym/s • Two L-band RF inputs with LNB control
ITU-T G.703	• ITU-T G.703 ready
DVB-ASI INPUT	• Interface: copper, BNC 75 ohm • TS bit rate: up to 150 Mbps
DVB-ASI OUTPUT	• 2 ASI connectors: copper, BNC 75 ohm • ASI options: - **ASI OUT 1** - output stream with decrypted selected program, output stream and loop-through - **ASI OUT 2** - output stream with decrypted selected program, output stream • PID dropping with PCR re-stamping (optional, available in future releases).

1.7.2. Decoder Outputs

FEATURE	SPECIFICATIONS
VIDEO	• Up to 2 decoders in 1RU • Analog video interfaces: - Up to 3 composite - Single S-video • Digital Video Interfaces: - SDI with embedded VBI and audio - Additional SDI with embedded VBI audio • Video Formats: - PAL-B/G/I/M/N/D, NTSC, SECAM L/B/G/K1 - Russian SECAM D/K (composite video only) • Decoding: - 4:2:0 MP@ML (1.5 – 15 Mbps) - 4:2:2 PP@ML (1.5 – 50 Mbps) • Video resolution interpolation: Pan-scan, letter box or Pass-through • Aspect ratios: 4:3/16:9 and 14:9 • Graphical processing: OSD, DVB subtitling, EBU (Teletext) subtitling (optional) • OSD only on monitoring output (optional) • Genlock input and loop-through output
FRONT PANEL MONITORING	• Video monitor output connector • Audio monitor output connector
VBI RE-INSERTION	• In composite video and embedded SDI • WST Teletext and inverted Teletext • WSS • VPS • VITC • CC • AMOL I, AMOL II (optional) • V-CHIP • Enhanced VITS with built-in generator

AUDIO	• Up to 4 analog audio stereo pairs interfaces • Up to 4 digital audio AES/EBU-SPDIF interfaces • Up to 4 stereo channels embedded in SDI • Modes: stereo, joint stereo, dual channel, single channel • Max output level: +18 dBu analog, 0 dBFs digital • Gain control: -64 dB to 0 dB/mute • Dolby Digital (AC-3) Pass-through • Dolby Digital (AC-3) LT/RT downmixing (optional) • Linear PCM (SMPTE 302M 2000), Dolby-E Pass-through (optional)
DATA	• Low speed data: RS-232 up to 115.2 Kbps, DB9 • High speed data: RS-422 Up to 20 Mbps, DB9 • IP over MPEG: up to 60Mbps (MPE de-capsulation) (optional)

1.7.3. Conditional Access

FEATURE	SPECIFICATIONS
EMBEDDED DVB-DESCRAMBLING	• BISS mode-1 • BISS-E • CAS-5000
DVB-CI	• Interface – 2 CI slots EN-50221 • CA methods – Multicrypt, Simulcrypt • CASs – Viaccess®, Irdeto®, Conax®, MediaGuard®, Nagravision®, Cryptoworks®, VideoGuard®, OnDigital®, CODICrypt®

1.7.4. Control and Monitoring

FEATURE	SPECIFICATIONS
LOCAL	• Graphical easy-to-use front panel • Up to 100 stored setups • Advanced satellite scanning • Operates in service and PID modes • GPI dry contacts for various status and fault indications
ENHANCED DVB MONITORING	• Front panel display: signal quality, Eb/N0, BER, ASI format, network and service information, CA information, CI slots, video and audio decoded information • OSD: PSI tables, receiver and decoder status information
REMOTE	• SNMP management • Web-based management • Telnet • Terminal via RS-232 or RS-485 • Software download
OVER THE AIR	• Control • Software download

1.7.5. Compliance

FEATURE	SPECIFICATIONS
EMC	• EN55013 (CISPR 13) • EN55020 (CISPR 20) • EN55022 (CISPR 22) • EN55024 (CISPR 24) • FCC part 15 (Class A) • CB
SAFETY	• EN60950 • CB (IEC60950) • UL60950 • CTUVus

1.7.6. Environmental Conditions

FEATURE	SPECIFICATIONS
OPERATION	• Temperature: 0°C - 50°C • Humidity: 5% - 90% (non-condensing)
STORAGE AND TRANSPORTATION	• Temperature: -40°C - 70°C • Humidity: 0% - 95% (non-condensing)

1.7.7. Physical and Power Specifications

FEATURE	SPECIFICATIONS
PHYSICAL	• 1RU unit, 19'' rack mountable • Dimensions (HxWxD) – 1RU X 19″ X 14″/44mm X 482.6mm X 357mm • Weight – 3.5Kg. /7.7lbs.
POWER	• Voltage: - 100 - 240V AC, 50/60Hz - 48v DC (optional) • Power consumption – up to 50w max

Chapter 2
INSTALLATION

2.1. GENERAL INFORMATION

This chapter describes the installing the IRD-2900 Series.

2.1.1. Safety Precautions

To avoid injury and prevent equipment damage, observe the following safety precautions:

- Do not move or ship equipment unless it is correctly packaged in its original wrapping and shipping containers.
- Only Scopus trained personnel can perform service and maintenance for the equipment.
- To prevent lightning damage, ground the unit according to local regulations.
- Do no permit unqualified personnel to operate the unit.

2.1.2. Inventory Check

CAUTION

IF ANYTHING IS MISSING OR DAMAGED, DO NOT CONTINUE WITH THE INSTALLATION. SEE THE PROCEDURES IN THE FRONT OF THIS MANUAL FOR SCOPUS SUPPORT.

Before installing the unit, ensure that all the equipment has arrived and check for damage according to the following list:

ITEM	QUANTITY
IRD-2900 Professional Integrated Receiver Decoder	1
Power cable	1
User manual, IRD-2900 Professional Integrated Receiver Decoder	1
Breakout cable if applicable	1/2

2.2. INSTALLATION INSTRUCTIONS

2.2.1. Site Preparation

NOTE

If the IRD is to be installed in a standard 19" rack, verify that the rack is fully prepared for the installation. To facilitate easy access during installation and maintenance, leave sufficient space behind the rack.

The IRD must be installed within 1.5m (5 feet) from an easily accessible grounded AC outlet, capable of furnishing the required supply voltage as detailed below (see Paragraph 2.4.1).

The use of a UPS (Uninterrupted Power Supply) and an AVR (Automated Voltage Regulation) is highly recommended to ensure uninterrupted operation of the IRD.

Ensure that a qualified electrician has installed the mains power supply in accordance with local power authority regulations. All powering should be wired with an earth leakage in accordance with local regulations.

CAUTION

ENSURE THAT THE RACK HAS BEEN CORRECTLY GROUNDED BEFORE SWITCHING ON THE IRD-2900 DEVICE. WHEN REMOVING THE UNIT, REMOVE THE GROUNDED CONNECTION ONLY AFTER THE UNIT IS SWITCHED OFF AND UNPLUGGED.

2.2.2. Mechanical Installation

The unit includes two mounting brackets. The brackets are fastened with screws on the sides of the IRD Chassis.

To prepare the IRD for rack installation:

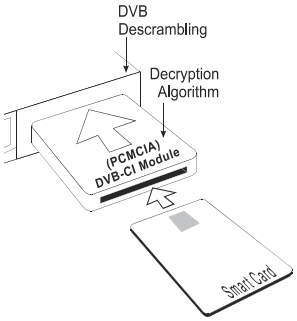
1. Fasten the brackets to the side rails of the rack with four screws (not included in the kit), two per side.

Several IRD devices can be installed in a standard 19" rack, one above the other.

2.2.3. Insertion of the DVB-CI Module (PCMCIA)

CAUTION

DO NOT ATTEMPT TO REMOVE OR INSERT THE DVB-CI MODULE OR THE SMART CARD WHILE THE IRD IS POWERING UP OR INITIALIZING.



The figure to the left illustrates the IRD with the DVB-CI module (PCMCIA card) and the Smart Card used to decrypt the incoming signal. The IRD is provided with two PCMCIA slots for up to two DVB-CI modules. The PCMCIA should be firmly inserted into one of the two slots provided to ensure contact. Each DVB-CI module accommodates one Smart Card, inserted with the UP mark pointing upwards and forward.

2.3. CABLE CONNECTION

The IRD-2900 provides all the connections on its rear panel.

The rear panel is comprised of audio outputs, video outputs, data outputs, and control interfaces (see Table 2-1 for cable information).

Figure 1-11 illustrates the IRD-2992 rear panel, as an example for connector types.

Figure 2-1: IRD-2992 Rear Panel

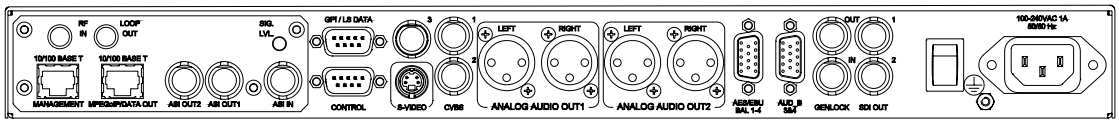


Table 2-1: IRD-2900 Rear Panel – Connectors and Cables

INTERFACE	CONNECTOR TYPE	CABLE TYPE
QPSK Front-end RF IN	75 Ω F-Type	RG-6
QPSK Front-end Loop Out Connector	75 Ω F-Type	RG-6
MPEGoIP Input	RJ-45	FTP Cat 5
Management	RJ-45	FTP Cat 5
MPEGoIP/DATA Output	RJ-45	FTP Cat 5
Analog Audio Out1 left	600 Ω XLR (balanced)	Shielded audio cable
Analog Audio Out1 right	600 Ω XLR (balanced)	Shielded audio cable
Analog Audio Out2 left	600 Ω XLR (balanced)	Shielded audio cable
Analog Audio Out2 right	600 Ω XLR (balanced)	Shielded audio cable
Video Out, S-Video Y/C	75 Ω DIN connector	Super video cable
Composite Video Out, CVBS1	75 Ω BNC	RG-59 RG11 A/U (recommended)
Composite Video Out, CVBS2	75 Ω BNC	RG-59 RG11 A/U (recommended)
Composite Video Out, CVBS3	75 Ω BNC	RG-59 RG11 A/U (recommended)
Data Output (RS-232/RS-422)	9 PIN D-Type	Serial Cable
Control (RS-232/RS-485)	9 PIN D-Type	Serial Cable
Audio Balanced 3 & 4	600 Ω D-sub 15p to 4XLR	Breakout Cable 204346 (Scopus material)
AES/EBU 1-4 Unbalanced	75 Ω 4xBNC or 75 Ω D-sub 15p	BNC Cable
ASI in/out1/out2	75 Ω BNC	RG-59 RG11 A/U (recommended)
Genlock In	75 Ω BNC	RG-59 RG11 A/U (recommended)
Genlock Out	75 Ω BNC	RG-59 RG11 A/U (recommended)
SDI out 1 &2	75 Ω BNC	RG-59

The IRD supports terminal control from a standard PC through a serial RS-232, RS-485, and GPI cable. Table 2-2 and Table 2-3 detail the pin-to-pin and signal assignments of the RS-232 and RS-485 cables respectively.

Table 2-2: RS-232 and RS-485 Control Connector Pin-Out Descriptions

PIN	DESIGNATION	PIN	DESIGNATION
1	RS-232 CD/RS-485 TX (+)	6	RS-232 DSR/RS-485 TX (-)
2	RS-232 RXD	7	RS-232 RTS
3	RS-232 TXD	8	RS-232 CTS/RS-485 RX (+)
4	RS-232 DTR	9	RS-232 Ring/RS-485 RX (-)
5	Common		

Table 2-3 also details the pin designations for data output (RS-232 and GPI). These two data flow protocols can be simultaneously enabled over the connector interface.

Table 2-3: RS-232 Low Speed Data and GPI Output Pin-Out Descriptions

PIN	DESIGNATION	PIN	DESIGNATION
1	GPI1 NC	6	GPI1 Common
2	RX Data	7	GPI1 NO
3	TX Data	8	GPI2 NC
4	GPI2 Common	9	GPI2 NO
5	Common		

Table 2-4: RJ-45 High Speed Data Pin-Out Description

PIN	DESIGNATION	PIN	DESIGNATION
3	Enable (-)	6	Enable (+)
4	Data (-)	7	Clock (-)
5	Data (+)	8	Clock (+)

Table 2-5: Audio 3-4 Breakout Cable (Scopus P/N 204346) Pin Out Description

PIN	DESIGNATION	PIN	DESIGNATION
1	Audio 4 XLR Right (+)	8	Audio 4 XLR Left Common
2	Audio 4 XLR Left (+)	10	Audio 3 XLR Left Common
3	Audio 3 XLR Right Common	11	Audio 4 XLR Right (-)
4	Audio 3 XLR Right (+)	12	Audio 4 XLR Left (-)
5	Audio 3 XLR Left (+)	14	Audio 3 XLR Right (-)
7	Audio 4 XLR Right Common	15	Audio 3 XLR Left (-)

Table 2-6: AES/EBU Balanced Breakout Cable (Scopus P/N 204345) Pin Out Descriptions

PIN	DESIGNATION	PIN	DESIGNATION
1	AES/EBU 4 (+)	8	AES/EBU 3 Common
2	AES/EBU 3 (+)	10	AES/EBU 1 Common
3	AES/EBU 2 Common	11	AES/EBU 4 (-)
4	AES/EBU 2 (+)	12	AES/EBU 3 (-)
5	AES/EBU 1 (+)	14	AES/EBU 2 (-)
7	AES/EBU 4 Common	15	AES/EBU 1 (-)

2.4. INITIALIZATION AND CONFIGURATION

Prior to turning on the IRD, ensure that all cabling is correct. Ensure that the unit is connected to the mains power supply and grounded according to local instructions.

2.4.1. Electrical Power Connection

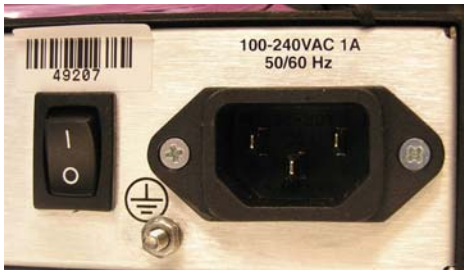
The IRD is powered by AC power. Connecting the AC power cable to the IRD AC connector makes the ground connection to the IRD.

When the IRD is rack-mounted, the jackscrew must be connected to the rack housing, which in turn should be correctly grounded.

For a view on the jackscrew, see Figure 2-2.

Figure 2-2: IRD Jackscrew Ground Connections

AC Power Supply Configuration 1



AC Power Supply Configuration 2

2.4.2. Powering Up

When powering up the IRD and the receiver is not tuned, expect one of the following warnings:

- Front-End warning – Demodulator not sync
- Bit Stream warning – No sync – 0x47 detected
- Bit Stream warning – PSI not detected

In case the IRD warning led is lit orange, the operator must perform the following:

- Tuning or configuring the IRD device
- Selecting a service from the input stream

When the IRD is correctly configured the display shows "All OK" and both LEDs are lit green.

NOTE

Prior to initialization, review the IRD Front Panel Operation (see Chapter 3) for how to use and navigate through the menus and for explanations of configuration parameters.

2.4.3. Tuning

The IRD receiver must be configured in order to receive a transport stream. For details about an IRD device with a DVB-S receiver module, see Paragraph 3.3.1.1. For details about an IRD device with an MPEG-over-IP front-end module, see Paragraph 3.3.1.2.

2.4.4. Selecting the Service

To select a service, see Paragraph 3.3.3.

2.4.5. Performing Serviceability Check

After installing, initializing, or configuring the IRD, maintenance checks must be performed to ensure that the unit is serviceable. A video monitor must be connected to the IRD in order to perform the check. Table 2-7 lists systematic instructions for performing a serviceability check.

Table 2-7: IRD Serviceability Check

STEP	CHECK
1	On the LCD display the LCD status message reads STATUS OK
2	On the IRD front panel the two LEDs are green
3	Service selected is displayed on the LCD display
4	Video picture on monitor
5	Audio channels left and right

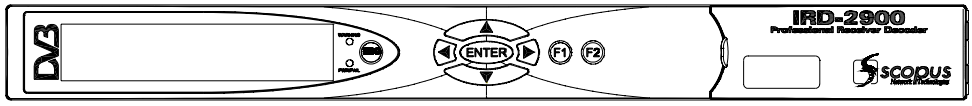
Chapter 3
IRD FRONT PANEL OPERATION

3.1. GENERAL INFORMATION

3.1.1. Controls and Displays

The front panel is used for extensive local control and for monitoring the operation. Figure 3-1 illustrates the IRD-2900 front panel.

Figure 3-1: IRD-2900 Front Panel



The IRD-2900 front panel contains:

- **LCD Display**
  The LCD display is a large, easy to use, graphical display. It is used to display enhanced menus with graphical interfaces, such as: charts, radio buttons, tables, and icons.
- **Status LEDs**
  The two LEDs show WARNING and PWR/FAIL statuses, when both LEDs are green the IRD status is OK. The WARNING LED (Green/Orange) indicates the operational status. The PWR/FAIL LED (Green/Red) indicates the hardware status.
- **Arrow Keys**
  The arrow keys include **[Up]**, **[Down]**, **[Right]**, **[Left]**. The keys are used to navigate between the different menu items and sub-menus. They are also used to select and change parameters during setup and configuration procedures.
- **[Enter] Key**
  The **[Enter]** key is used to select or enter a configuration setup.
- **[Esc] Key**
  The **[Esc]** key is used to abort a configuration setup or to return to the menu's previous level.

- **Short Cut Keys**
  The short cut keys include the **[F1]**/**[F2]** buttons. These buttons are operator–programmable for immediate activation of predefined procedures (in future software version).

3.1.2. IRD Front Panel Screen Types

The IRD-2900 display has access to the following five screen types:

- Menu navigation screen
- Edit Menu screen
- Table Menu screen
- Edit value screen
- Select value screen

NOTE

When a menu has more than four items, the manual displays two screens: dark grey and light grey. The dark grey screen displays the first four items visible followed by *. Additional items are shown in a grey screen and can be accessed using **[up]/[down]**.*

NOTE

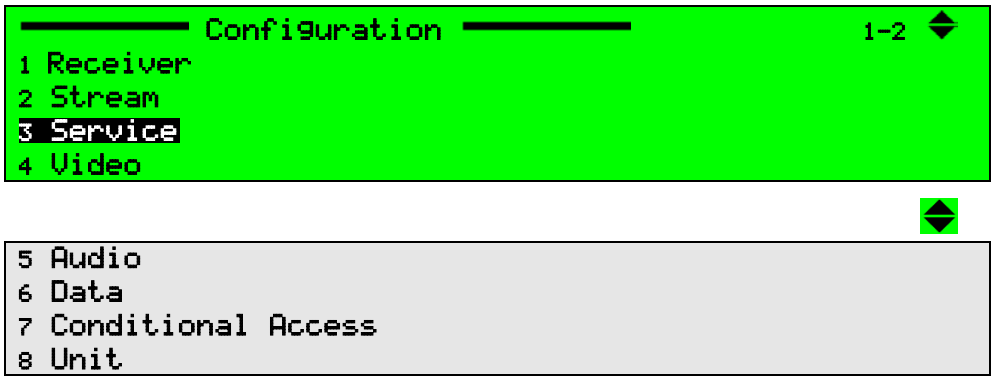
*Move up or use **[Enter]** to select the item.*

The following paragraphs describe the different front panel screen types.

3.1.2.1. Menu Navigation Screen

The **Menu Navigation** screen enables navigating through the tree structure of the IRD-2900 menu.

In this example, the **Menu Navigation** screen displays the following items:



A. Top line indicates the menu name (Configuration) and the menu hierarchal position (1-2, for example Configuration under the Root menu). **[**▲Up**]/[**▲▼Up/Down**]/[**▼Down**]** symbols indicate that up or down scrolling is possible.

B. Next up to four displayed lines is a list of numbered items.

C. Additional Available Items

The list can include more than four items, but only four items are visible at a time. When more than four items are enabled, you can scroll using the **[UP]/[Down]** arrow keys on the IRD-2900 front panel.

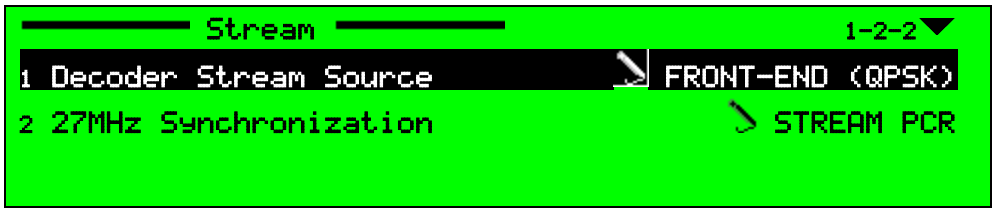
The currently selected option is displayed with white characters over a black background (see Item #3 in the example).

To enter the next menu level press **[Enter]** to select the marked item (either another Menu Navigation screen or an Edit Menu screen).

3.1.2.2. Edit Menu Screen

The **Edit** menu screen enables you to select, change or display the value of a parameter or set of parameters.

In this example, the **Edit Menu** screen displays the following items:



A. Top line indicates the menu name (Stream) and the menu hierarchal position **(1-2-2**, for example Root-Configuration-Stream) in the IRD-2900 Menu Tree. **[**Up**]**/**[**Up/Down**]**/**[**Down**]** symbols indicate that up or down scrolling is possible.

B. Next up to four displayed lines is a list of numbered items relevant to the menu and their current values. The information provided for each item in the list is:

- **Left-aligned column** displays a numbered list of parameters.
- **Right-aligned column** displays the value of the parameter.
  - Editable parameters have a pencil icon next to them.
  - Parameters without the pencil icon are informative only.

C. Additional Available Items

The list can include more than four items, but only four items are visible at a time. When more than four items are enabled, you can scroll the list using the **[UP]/[Down]** arrow keys.

The currently selected option is displayed with white characters over a black background (see Item #1 in the example).

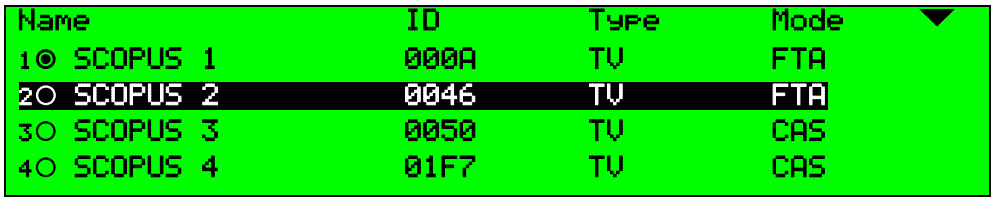
Press **[ESC]** to abort the selection or to return to the menu's previous level.

Press **[Enter]** to select the pointed editable option; a parameter-editing screen is displayed. This can be a Table Menu screen, an Edit Value screen, or a Select Value screen.

3.1.2.3. Table Menu Screen

The **Table** menu screen displays information about various parameters using a table format.

In this example, the **Table Menu** screen displays the following columns:



A. Top line displays the headers for each table column.

B. Next up to four displayed lines is a numbered list of parameters relevant to the menu and their current values. A radio button indicates which parameter is currently active (◉ currently enabled and ○ currently disabled)

C. Additional Available Items

The list can include more than four items, but only four items are visible at a time. When more than four items are available, you can scroll the list using the **[UP]/[Down]** arrow keys.

The currently selected option is displayed with white characters over a black background (see Item #2 in the example).

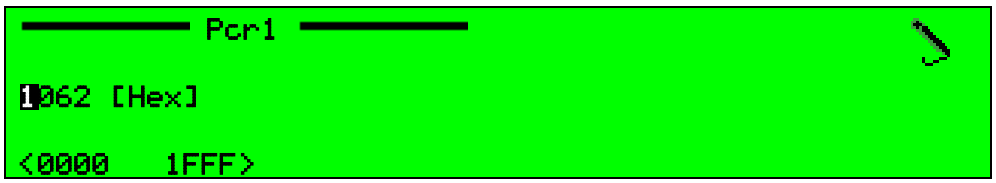
Press **[ESC]** to abort the selection and return to the Edit Menu screen without changing the parameters.

Press **[Enter]** to select the currently enabled button ◉**.** The selected option becomes enabled and the former active option is disabled.

3.1.2.4. Edit Value Screen

The **Edit Value** screen enables setting up a parameter value. The parameter value can be a number or a string of characters. Each digit or character is set up individually.

In this example, the **Edit Value** screen displays the following information:



A. Top line displays the parameter name (Pcr1). The pencil icon indicates that the parameter value is editable.

B. Second line displays the current value of the parameter. Changing the value of the parameter is performed using the arrow keys:

- **[Left]** and **[Right]** arrow keys are used to mark a digit or a character for change. The marked digit or a character is displayed with white character over black background (see example above)
- **[Up]** and **[Down]** arrow keys are used to scroll up or down the digits (range 0 thru 9) or the characters (a to z, A to Z, 0 to 9 and ctr.). The scroll range can be limited to prevent setting up values out of range.

C. Third line displays the allowed range of values for the parameter.

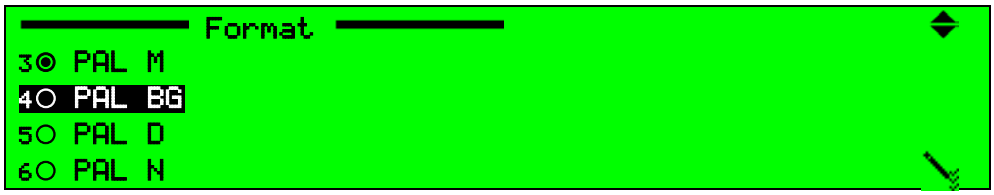
Press **[ESC]** to abort the setup and return one level up to the Edit Value Screen without changing the parameters.

Press **[Enter]** to accept the value. The display returns one level up to the Edit Value Screen and the new value is displayed as the current value of the parameter.

3.1.2.5. Select Value Screen (Multiple Choices)

The **Select Value** screen displays a list of selectable items.

In this example, the **Select Value** screen displays the following information:



A. Top line displays the parameter name (Format). The pencil icon indicates that the items are selectable from a list of displayed options. **[**▲Up**]/[**▲▼Up/Down**]/[**▼Down**]** symbols indicate that up or down scrolling is possible.

B. Next up to four displayed lines is a numbered list of parameters relevant to the menu and their current values. A radio button indicates which parameters are currently activated (◉ currently enabled and ○ currently disabled)

C. Additional Available Items

The list can include more than four items, but only four items are visible at a time. When more than four items exist, you can scroll the list using the **[UP]/[Down]** arrow keys.

The currently selected option is displayed with white characters over a black background (see Item #4 in the example).

Press **[ESC]** to abort setup and return one level up of the Select Value Screen without changing the parameters.

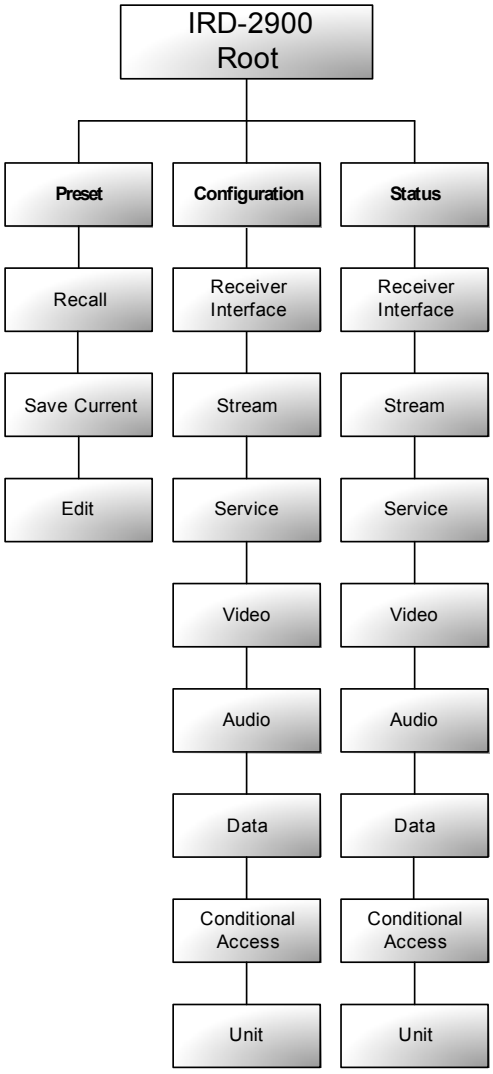
Press **[Enter]** to select the marked option (the selected option becomes enabled ◉ and the former enabled option is disabled ○). The display returns up one level to the Select Value screen; the new option is displayed as the current option of the parameter.

3.1.3. IRD Menu Tree

Setup, control, and monitoring of the IRD-2900 operation can be performed locally by using the IRD-2900 Menu.

This menu is displayed on the front panel LCD display and is operated using the front panel control keys. The basic tree structure of the IRD front panel menu is illustrated in Figure 3-2.

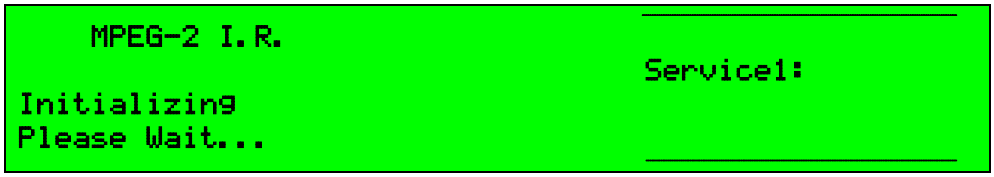
Figure 3-2: IRD-2900 Front Panel Menu (Root Menu) - Basic Structure



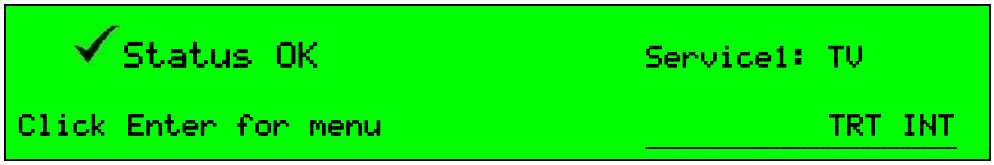
3.1.4. IRD Menu Operation

To activate the **IRD Front Panel Root Menu** perform the following:

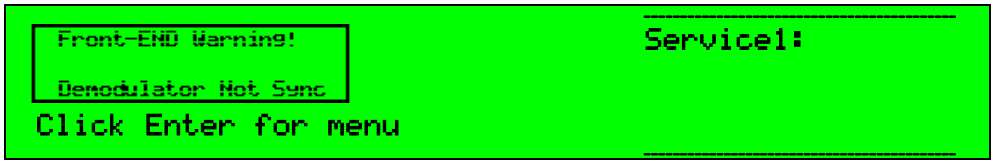
1. Power up the IRD-2900. The IRD initialization phase begins. The IRD displays the initialization display:



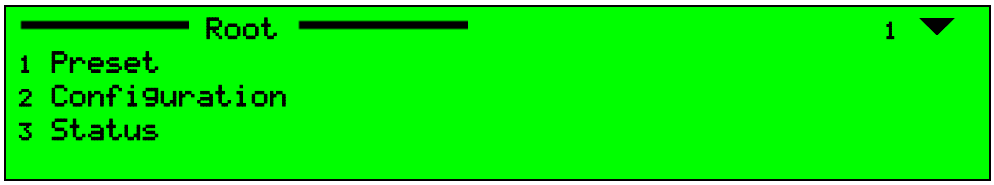
2. When the initialization process is completed, the IRD displays one of the two options:
   - **Status OK** – Both green LEDs are lit.



   - **Front-End Warning** – The warning led turns orange.



3. Click **[Enter]** to activate and enter the IRD Root Menu:



The IRD Root Menu provides the following main branch options:

- **IRD Preset Menu** – See Paragraph 3.2 for a detailed description.
- **IRD Configuration Menu** – See Paragraph 3.3 for a detailed description.
- **IRD Status Menu** – See Paragraph 3.4 for a detailed description.

3.2. PRESET MENU

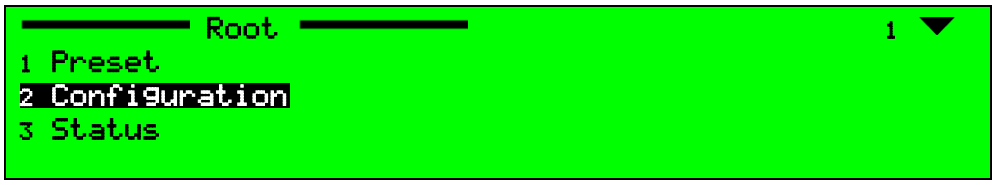
The IRD Preset main menu will be supported in future software releases.

3.3. CONFIGURATION MENU

The IRD Configuration Main Menu allows configuring parameters, including general operating, control, and setup procedures.

The IRD Configuration Main Menu is entered from the IRD Root Menu.

To select the Configuration Menu, select the "Configuration" option in the Root Menu (navigate vertically by using the **[Up]/[Down]** arrow keys and pressing **[Enter]**).



The **Configuration Menu** is displayed in the following menu navigation screen (eight selectable items):

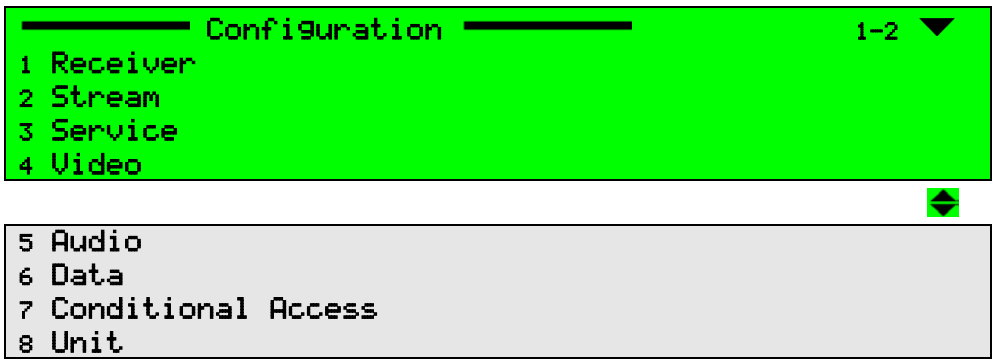
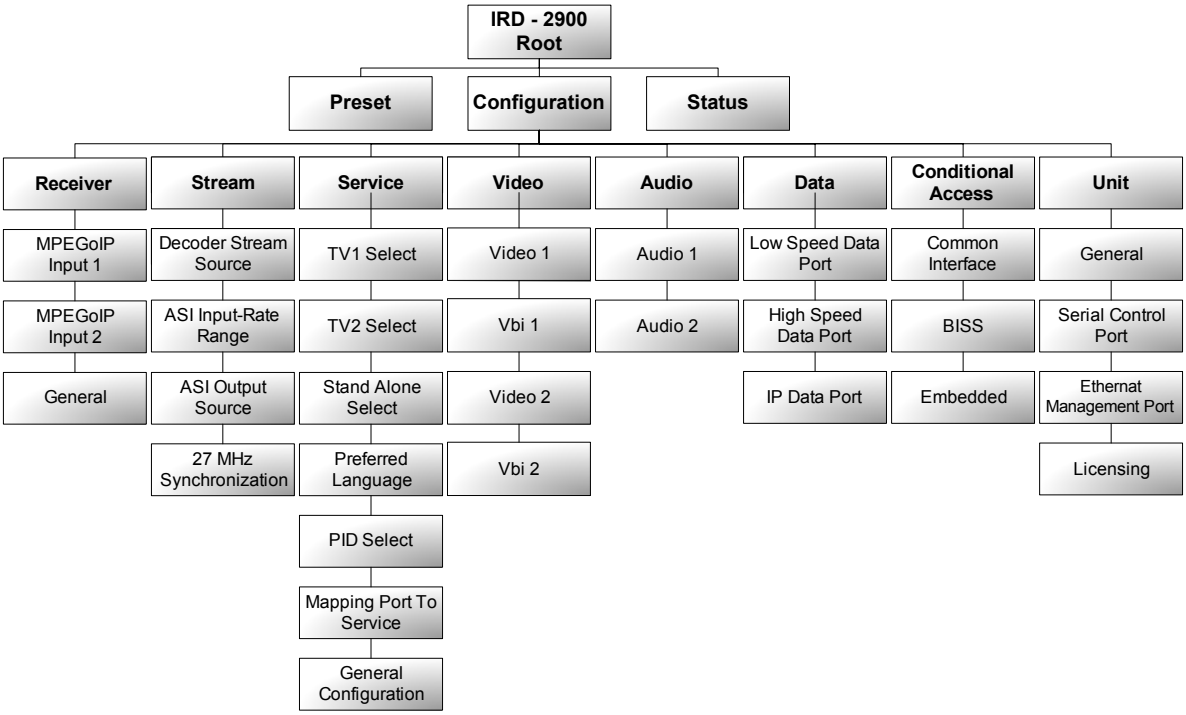


Figure 3-3 illustrates the IRD Configuration menu structure and the available options.

Figure 3-3: IRD Configuration Menu Structure



NOTE

The IRD-2900 can support either IP or QPSK receiving modules. The configuration menu structure changes in accordance to each of these available module options.

3.3.1. Receiver Module Configuration Menu

The IRD-2900 series is provided with a wide range of TS interface options. The **Receiver Configuration Menu** provides access to the relevant receiver module. The following input interface options are supported by the IRD-2900:

1. **QPSK RECEIVER CONFIGURATION MENU**
   The QPSK Receiver Configuration menu is used in setting the QPSK receiver parameters for tuning the IRD to the required TS.
   This menu provides configuration options for the QPSK modulated input signal. It is available only in an IRD-2900 equipped with a Satellite QPSK Receiver Front-End Module. For details, see Paragraph 3.3.1.1

2. **IP RECEIVER CONFIGURATION MENU:**
   The IP Receiver Configuration menu is used in setting the MPEG-over-IP interface for defining IP connectivity and a source TS.
   This menu provides configuration options for parameters used for defining IP-network connectivity parameters for the IRD device and the source transport stream. It is available only in an IRD-2900 equipped with an IP front-end module. For details, see Paragraph 3.3.1.2.

3.3.1.1. QPSK Receiver Configuration Menu

NOTE

The Configuration Menu for the QPSK Front-End Receiver option is available only when the QPSK Front-End is installed.

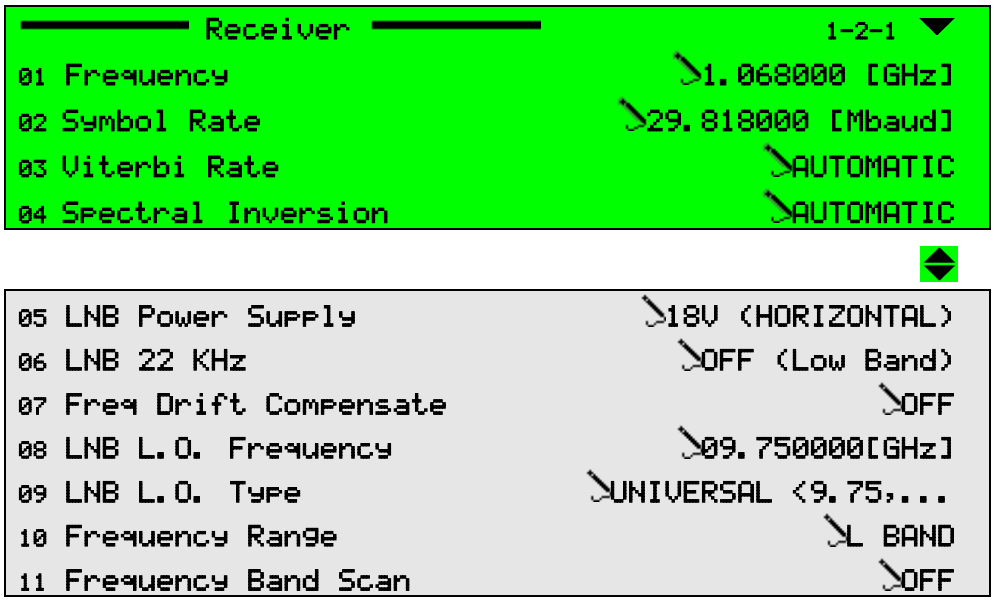
The LNB local oscillator (L.O.) Frequency parameter is activated when the Ku/C-Band is selected.

The **QPSK Receiver Configuration Menu** contains the following parameters, used to tune the receiver to the input signal:

- **Frequency** – Satellite transponder frequency. Can be acquired from satellite transponder information.
- **Symbol Rate** – Can be acquired from satellite transponder information.
- **Viterbi Rate** – Can be detected automatically or acquired from satellite transponder information.
- **Spectral Inversion** – Can be detected automatically or acquired from satellite transponder information.
- **Horizontal and Vertical Polarization** – Can be acquired from satellite transponder information.
- **LNB L.O. type** – Can be acquired in accordance to the frequency range and antenna installation.

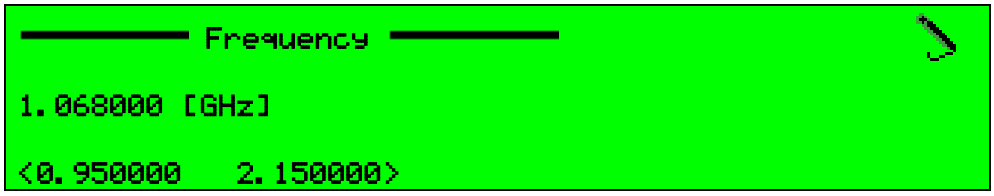
- **Freq Range** – possible frequency ranges: Ku-Band, C-Band, or L-Band

The **QPSK Receiver Configuration Menu** is entered from the IRD Configuration Main Menu (see Paragraph 3.3) and is displayed in the following menu format:



The following paragraphs provide information about the **QPSK Receiver Configuration** options.

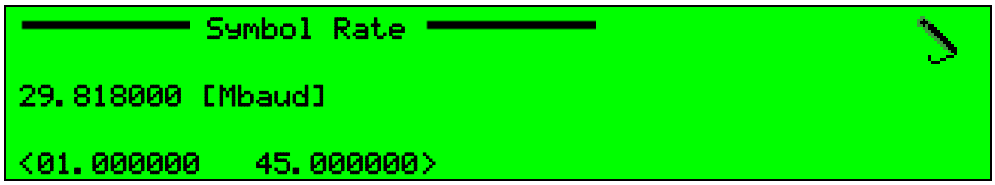
- **FREQUENCY SETUP**
  The **Frequency** parameter must be set in accordance with the required satellite transponder frequency. The frequency can be acquired from the satellite transponder information.



  The range of available frequency depends on the selected frequency range or item:

  - **Ku-Band** – 10.700000GHz – 12.750000GHz
  - **C-Band** – 3.200000GHz – 4.200000GHz
  - **L-Band** – 0.950000GHz – 2.150000GHz

- **SYMBOL RATE SETUP**
  The **Symbol Rate** parameter must be set in accordance with the satellite transponder symbol rate. The Symbol Rate value can be acquired from the satellite transponder information or can be calculated, with the bit rate information.

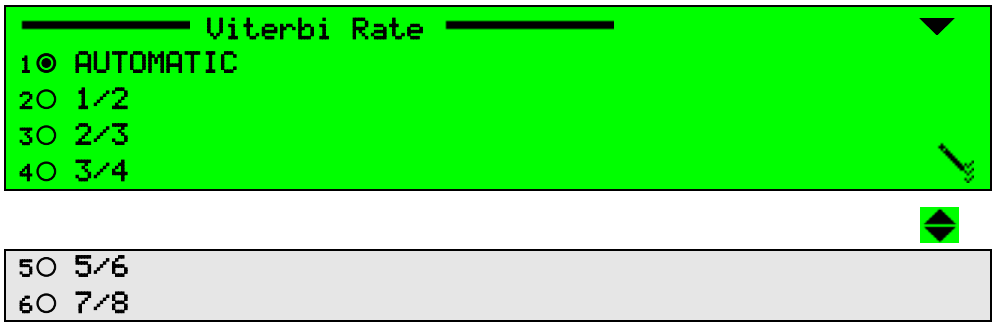


  The available Symbol Rate range is a numeric value between 01.000000 and 45.000000.

NOTE

It is important to input the accurate Symbol Rate down to the sixth digit after the decimal point.

- **VITERBI SETUP**
  The **Viterbi Rate** parameter sets the Viterbi error correction rate value. The Viterbi parameter can be acquired from the satellite transponder information or can be set to automatic. When set to automatic mode, the IRD-2900 device tries all Viterbi rates until locking the rate to the transport stream.



  The available options are:

  - **Automatic**
  - **1/2**
  - **2/3**
  - **3/4**
  - **5/6**
  - **7/8**

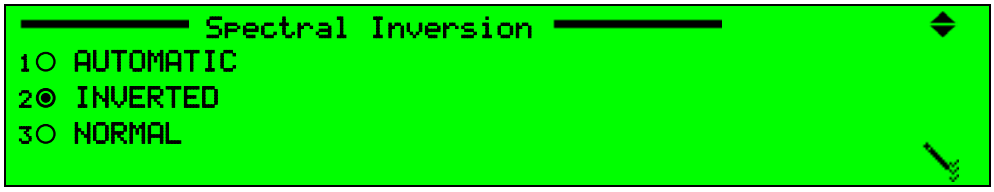
NOTE

If the specific Viterbi rate is not provided, selecting the Automatic option enables the IRD to automatically detect the Viterbi rate.

- **SPECTRAL INVERSION SETUP**

  The **Spectral Inversion** parameter sets the spectral mode of operation. This parameter is configured according to the information provided from the broadcast head-end or can be set to automatic.

  When set to automatic mode, the IRD-2900 tries the two spectral modes until obtaining synchronization.



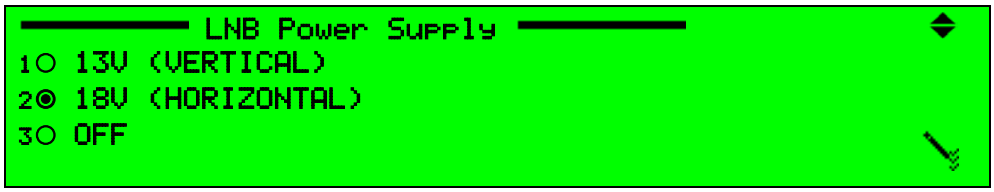
The available options are:

- **Automatic** – Automatically selects between Normal and Inverted spectral mode
- **Inverted** – Inverted spectral mode
- **Normal** – Normal spectral mode

- **LNB POWER SUPPLY SETUP**

  The IRD sets the polarization of the receiving antenna by providing different voltage levels to the LNB, 13v for vertical polarization and 18v for horizontal polarization.

  The polarization of the receiving antenna is determined according to the polarity of the satellite transponder.

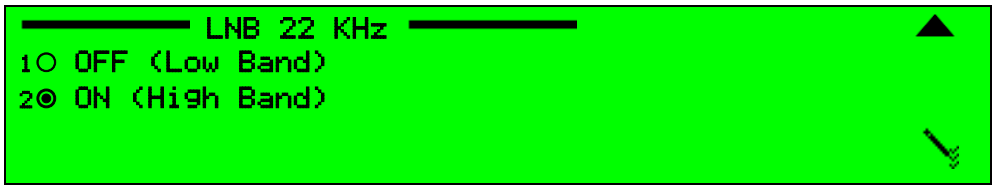


The available options are:

- **OFF**: No voltage is supplied to the LNB. Use this option either when cascading IRDs using the loop-through connector on the QPSK interface or when this voltage is supplied to the LNB by external source.
- **13V (Vertical)** – Vertical polarization
- **18V (Horizontal)** – Horizontal polarization

- **LNB 22 KHz SETUP**
  The receiver controls the LNB band by sending a 22KHz signal. When the signal is sent, the LNB uses its High Band Local Oscillator (L.O.). When the signal is not sent, the LNB uses its Low Band L.O.

  The local oscillator is used to convert the signal from Ku-Band or C-Band to L-Band. Two local oscillators exist one for each band to leverage full spectrum.



The available options are:

- **OFF** – Low band L.O.
- **ON** – High band L.O.

- **FREQ DRIFT COMPENSATE SETUP:**
  This option enables or disables the frequency drift compensation function. When frequency drift compensate mode is enabled, the IRD tracks frequency drifts which are caused by a drift in the LNB L.O. and caused by environmental changes.

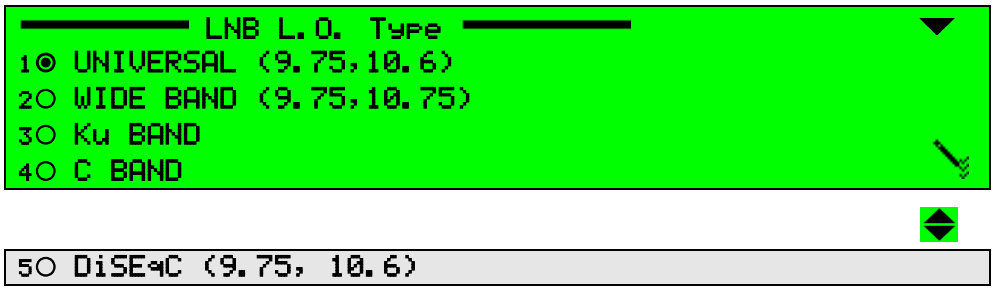
The available options are:

- **OFF**
- **ON**

- **LNB L.O. TYPE SETUP**
  The **LNB L.O. type** parameter defines the LNB oscillator type in use. Two standards are generally used: 'Universal' and 'Wide Band'.
  In addition, the oscillator value can be manually configured.
  The LNB L.O. type can be acquired from satellite transponder information. Most satellites use the 'Universal' type of L.O. unless specified otherwise.

NOTE

Manual configuration of the oscillator frequency is rarely used and is intended for advanced users only.



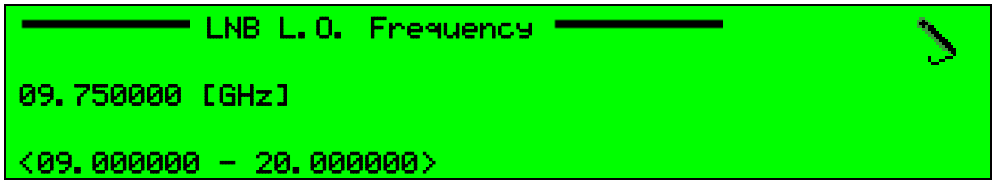
The available options are:

- **Universal (9.75,10.6)** – Defines LNB universal L.O. type
- **Wide Band (9.75, 10.75)** – Defines LNB wide band L.O. type
- **Ku-Band** – Defines Ku-Band LNB L.O. type
- **C-Band** – Defines C-Band LNB L.O. type
- **DiSEqC (9.75, 10.75)**

NOTE

When selecting the Ku-Band or the C-Band, you must manually set the L.O. frequency (see the following Section I in this chapter).

- **LNB L.O. FREQUENCY SETUP**
  The **LNB L.O. Frequency** parameter defines the down converting frequency. The carrier is converted from either Ku Band or C Band to L Band. The LNB L.O. frequency parameter is displayed when the Ku or C-Band is entered from the LNB L.O. type menu. This is used by the IRD to tune the input filters to the incoming signal frequency.



The available LNB L.O. frequency range is a value between 9.000000 and 20.000000

NOTE

The LNB L.O. frequency range changes in accordance with the band type:

Ku-Band L.O. frequency range, 9.000000 – 20.000000

C-Band L.O. frequency range, 5.000000 – 6.000000

- **FREQUENCY RANGE SETUP**
  The **Frequency Range** parameter defines the input frequency band: Ku-Band, C-Band, or L-Band.
  This parameter affects the displayed frequencies and ranges of the IRD QPSK receiver parameters.

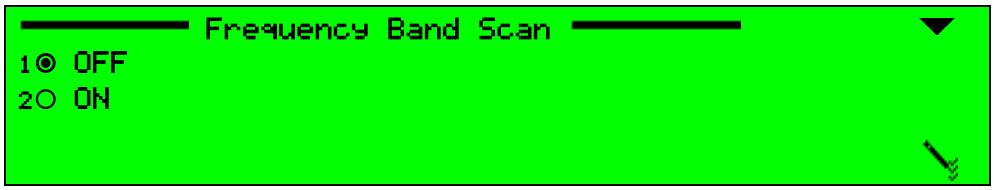
The available options are:

- **L-Band** – Receiving in the L-Band frequency range
- **Ku-Band** – Receiving in the Ku-Band frequency range
- **C-Band** – Receiving in the C-Band frequency range

- **FREQUENCY BAND SCAN COMMAND:**
  The **Frequency Band Scan Command** allows scanning the selected frequency range if the frequency is unknown. The symbol rate must be known and set in the IRD. The IRD scan the frequency range, while seeking a valid DVB stream. Upon locating a valid DVB stream, the IRD marks the located frequency and service name. Results output either to the RS-232 port (terminal) or Telnet. The following figure displays the Frequency Band Scan Screen

NOTE

The IRD scans only the L-band frequency range. Located frequencies are shown in L-Band and must be modified for the relevant frequency value if they are tuned to either C-band or Ku-band.



The available options are:

- **OFF** – Frequency scan is disabled
- **ON** – Frequency scan is enabled

3.3.1.2. IP Receiver Configuration Menu

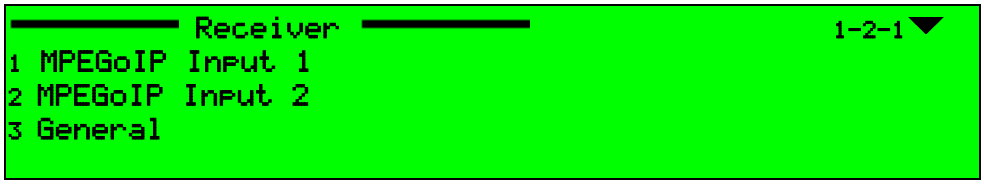
NOTES

The Configuration Menu for the IP Front-End receiver is activated only when the IP Front-End receiver interface option is installed in the IRD.

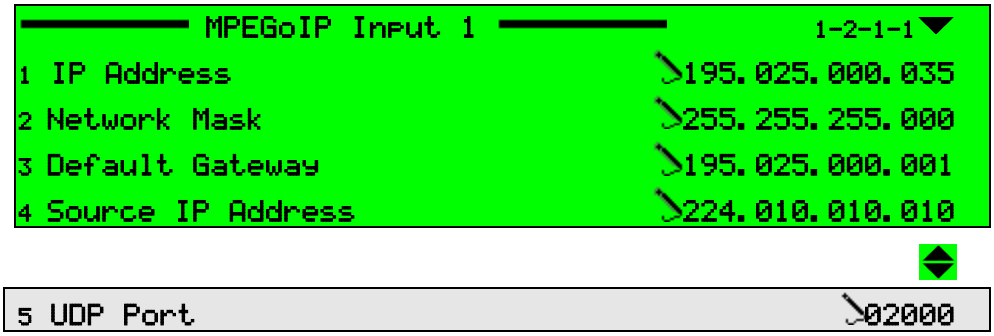
Make sure all switches and routers are IGMPv2 enabled and that all transport stream sources have unique multicast IP address.

The **IP Receiver Configuration Menu** contains parameters that are used for connecting the IRD to the IP network for connecting to a relevant TS source.

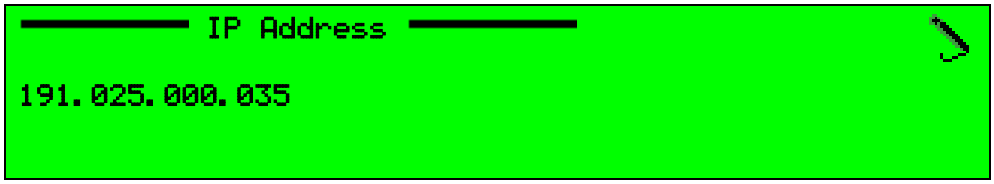
The **IP Receiver Configuration Menu** is entered from the IRD Configuration Main Menu (see Paragraph 3.3) and is displayed in the following menu format:



MPEGoIP Input #

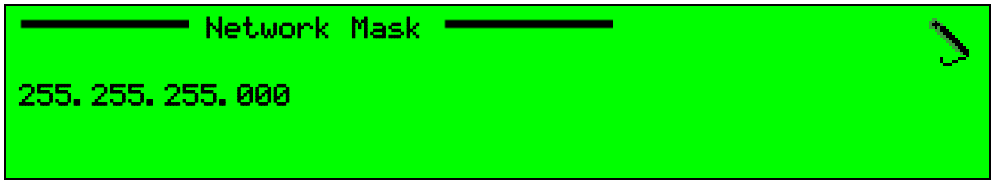


- **IP ADDRESS**
  The **IP Address** parameter defines the IP interface IP address.



  The value in each field must be a number between 0 and 255.

- **NETWORK MASK**

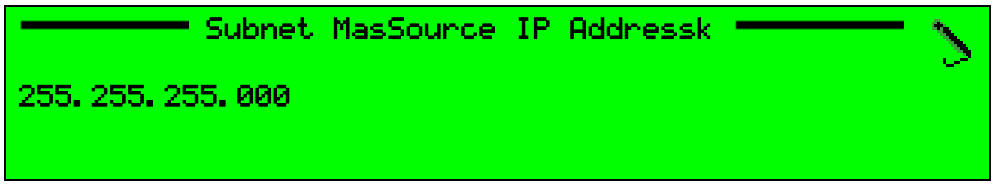


  The value in each field must be a number between 0 and 255.

- **DEFAULT GATEWAY**
  The **Default Gateway** parameter defines the network default gateway address. This is the address of a local IP router on the same network as the IRD-2900 that is used to forward traffic beyond the local network.

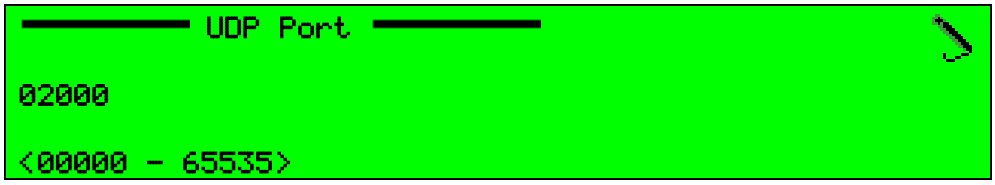
  The value in each field must be a number between 0 and 255.

- **SOURCE IP ADDRESS**
  The Source **IP Address** parameter defines the transport stream IP address. IP address could be either Unicast or Multicast.



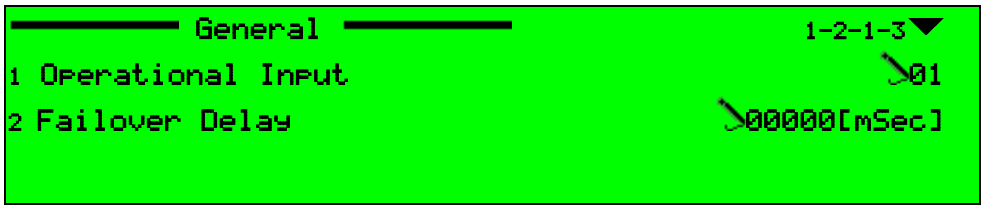
  The value in each field must be a number between 0 and 255.

- **UDP PORT**
  The **UDP Port** parameter defines the port number of the transport stream source.

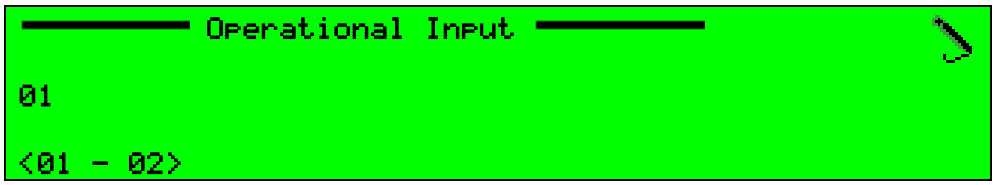


The available range is a number between 0 and 65535.

GENERAL



- **OPERATIONAL INPUT**
  The **Operational Input** parameter defines and activates the primary port.



The available range is a value between 01 and 02.

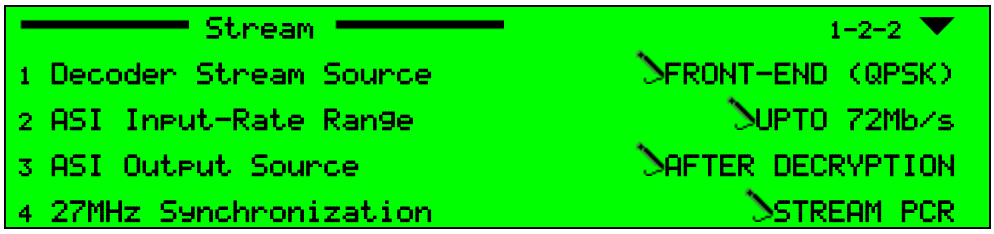
- **FAILURE DELAY**
  When a failure occurs The **Failure Delay** parameter defines the amount of time in mSec before switching to the redundant port.

The available range is a value between 0 and 20000, in millisecond units. .

3.3.2. Stream Configuration Menu

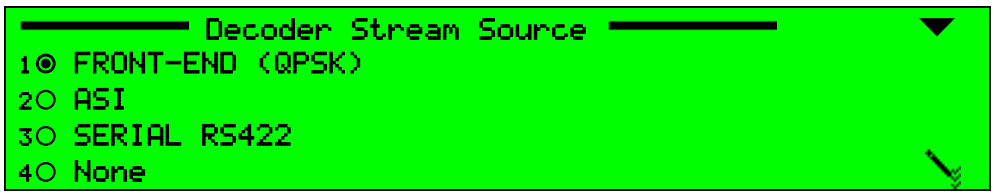
The **Stream Configuration Menu** contains parameters that are used for handling the input stream.

The **Stream Configuration Menu** is entered from the IRD Configuration Main Menu (see Paragraph 3.3) and is displayed in the following menu format:

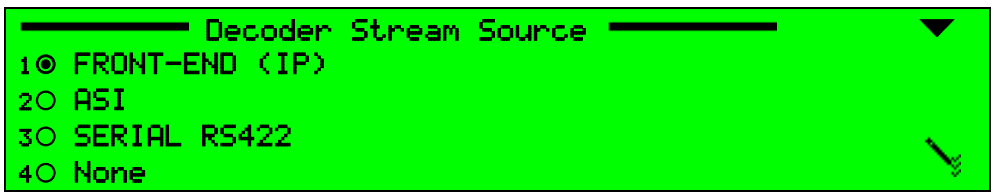


The following paragraphs provide information about the **Stream Configuration** parameters.

- **DECODER STREAM SOURCE**
  The IRD supports a wide range of optional input interfaces, allowing the IRD to receive input streams from different sources.
  The **Decoder Stream Source** parameter defines the input stream source.
  When a QPSK receiver is active in the IRD, the following menu is displayed:



  When an IP receiver interface is active in the IRD, the following menu appears:



NOTE

The Decoder Stream Source screen is dynamic and it changes according to the currently active IRD interface.

The available options are:

- **Front-end (QPSK)** (if applicable) – Selects the QPSK Receiver Front-end Interface as the source for the input transport stream
- **Front-end (IP)** (if applicable) – Selects the IP Front-End Interface as the source for the input transport stream
- **ASI** – Select the ASI digital input as the source for the input transport stream
- **Serial RS422** – Selects the RS-422 serial input as the source for the input transport stream

NOTE

Qualified personnel should handle serial RS-422 option only.

- **None**: No input source is selected for the IRD-2900.

NOTE

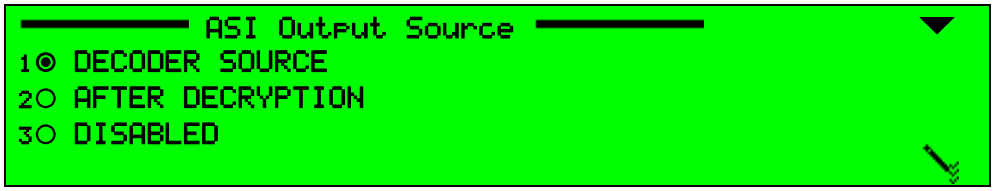
*When **Front-End (IP)** is selected, the **27Mhz Synchronization** option must be set to **Fixed-Value** (see the following Section D in this chapter).*

- **ASI INPUT-RATE RANGE**
  The **ASI Input-Rate Range** parameter defines the range of the ASI input rates.

The available options are:

- **UPTO 72Mb/s** – Selected when using a CAM for descrambling
- **UPTO 108Mb/s** – Selected when bypassing the CI
- **ABOVE 108Mb/s** – Selected when using PID dropping option

- **ASI OUTPUT SOURCE**
  The **ASI Output Source** defines the type of output source.

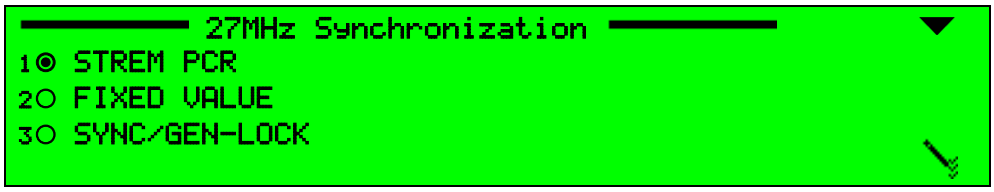


The available options are:

- **Decoder Source** –Input stream is directly routed to the ASI output
- **After Decryption** – Stream traverses the CAM and then is directed to the ASI output
- **Disabled** – ASI output signal is disabled

- **27 MHZ SYNCHRONIZATION**
  The **27 MHz Synchronization Configuration Option** defines the synchronization source for the IRD VCXO.

  The Decoder Synchronization Source is a 27 MHz clock, generated by a Voltage Controlled Cristal Oscillator (VCXO). It is used to synchronize the IRD to the MPEG stream.



The available options are:

- **Stream PCR** – The VCXO is synchronized to the program clock recovered from the PCR data.
- **Fixed Value** – The VCXO is running in free mode.
- **Sync/Gen-Lock** – Synchronizes the IRD according to external video signal

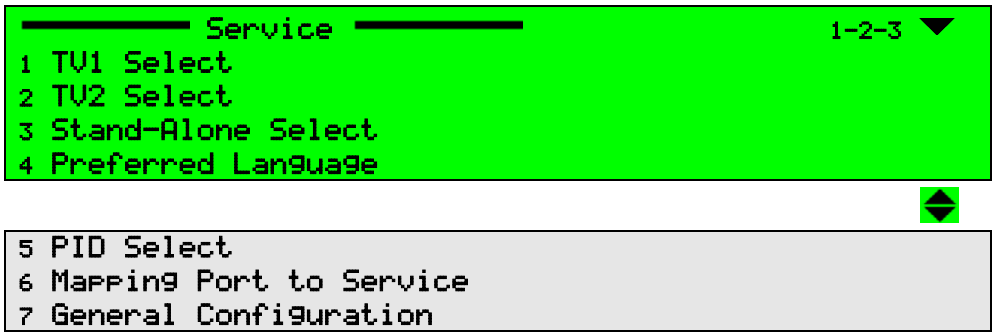
NOTE

The VCXO is factory calibrated to a fixed 27 MHz clock.

3.3.3. Service Configuration Menu

The **Service Configuration Menu** contains parameter setups for video and VBI services.

The **Service Configuration Menu** is entered from the IRD Configuration Main Menu (see Paragraph 3.3) and is displayed in the following menu format:



The **Service Configuration Menu** parameters are categorized as follows:

- **TV1 and TV2 Select (if applicable)**

  Enables to assign a service from the incoming TS to a decoder. In the case of a dual decoder, a user can assign two services from the incoming TS, one for each decoder (see Paragraph 3.3.3.1).

- **Stand-Alone**

  This feature will be supported in future software releases.

- **Preferred Language**

  This group contains parameters that define the preferred language (see Paragraph 3.3.3.3).

- **PID**

  This group contains parameters that define the PID components in the elementary stream (see Paragraph 3.3.3.2).

- **Mapping Port to Service**

  This group contains parameters that define the port mapping and service components for each elementary stream (see Paragraph 3.3.3.5).

- **General Configuration**

  This group contains parameters that define the response of the IRD to various operational states (see Paragraph 3.3.3.6).

3.3.3.1. TV1 and TV2 Select

The **TV1 and TV2 Table Menu** screen lists the services analyzed from the service descriptor contained in the SDT.

The services in the TV1 Select and TV2 Select Configuration are displayed in a four-column table.

The **TV1 and TV2** table menu is entered from the IRD Service Configuration Menu (see Paragraph 3.3.3). The following figure displays the TV1 and TV2 table menu:

Name	ID	Type	Mode
1◉ SCOPUS 1	000A	TV	FTA
2○ SCOPUS 2	0046	TV	FTA
3○ SCOPUS 3	0050	TV	CAS
4○ SCOPUS 4	01F7	TV	CAS

The information in the table is categorized as follows:

a. **Name** – Service name

b. **ID** – Service identification (ID)

c. **TYPE** – The service type. Options: **TV, Radio, TLTX, NVOD, MOSAIC, PAL, SECAM, MAC, FM, NTSC, and Data**.

d. **MODE** – Indicates if the service is encrypted (**CAS**) or free to air (**FTA**).

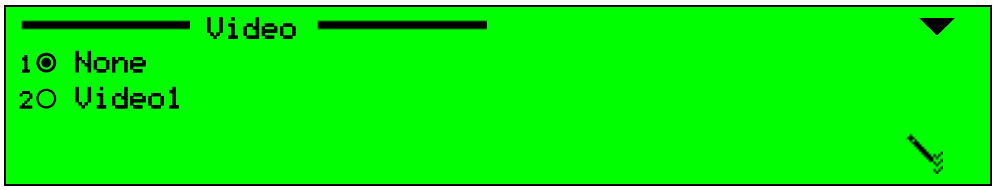
Selecting a service from the **TV1 and TV2 Table** displays the following **Service Information** table screen relevant to the selected service:

TYPE	PID	Description	Port
1 PCR	1262		PCR1
2 Video	1262		Video1
3 Audio	1273	ATSC AC3	Audio1
4 VBI	1269		VBI1

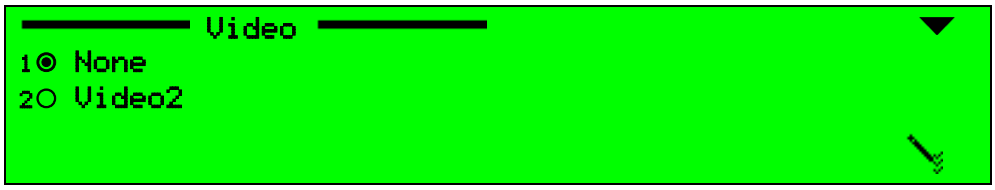
The following paragraphs provide information about the available elementary streams.

- **PCR**
  The **PCR** elementary stream is for viewing only.

- **VIDEO**
  The following figure displays the **TV1 Video** screen:



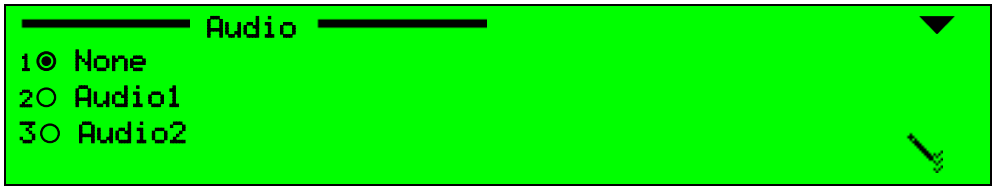
  The following figure displays the **TV2 Video** screen:



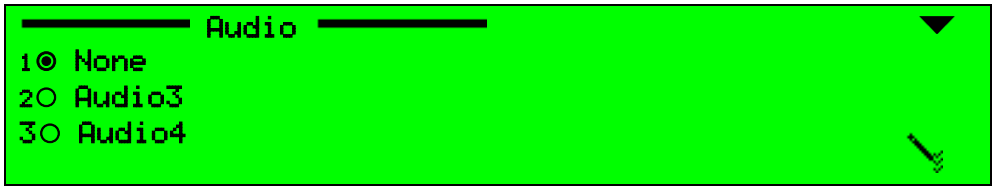
  The available options are:

  - **None**
  - **Video 1 and Video 2**

- **AUDIO**
  The following figure displays the **TV1 Audio** screen:



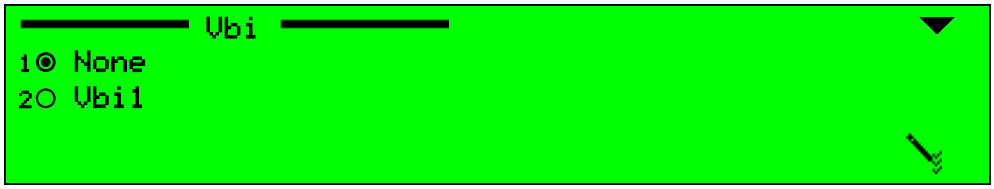
  The following figure displays the **TV2 Audio** screen:



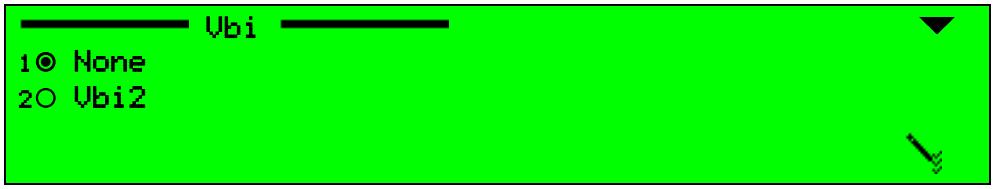
  The available options are:

  - **None**
  - **Audio 1 and Audio 3**
  - **Audio 2 and Audio 4**

- **VBI**
  The following figure displays the **TV1 VBI** screen:



  The following figure displays the **TV2 VBI** screen:



  The available options are:

  - **None**
  - **VBI 1 and VBI 2**

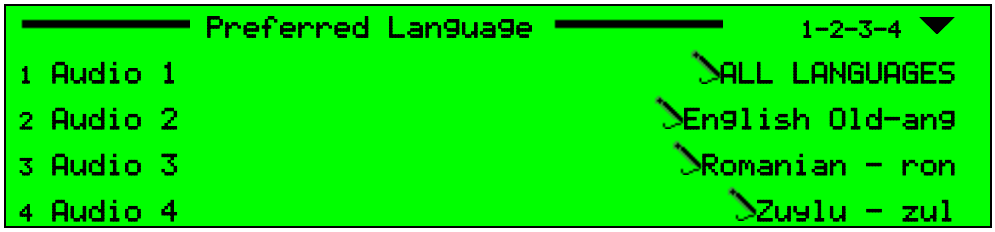
3.3.3.2. Stand-Alone Select

This feature will be supported in future software release.

3.3.3.3. Preferred Language

The **Preferred Language Edit Menu** screen lists the audio channels available for the received services.

The **Preferred Language Menu** is entered from the IRD Service Configuration Menu (see Paragraph 3.3.3). The following figure displays the Preferred Language menu:



NOTE

*The number of audio channels provided in the **Preferred Languages Menu** is dynamic and is determined by the IRD-2900 model. Audio 3 and Audio 4 channels are available for dual decoders, IRD-2980, and IRD 2981 models only.*

Selecting an audio channel displays a **Select Value** screen that lists available languages:

01. ALL Languages
02. Albanian - alb
03. English Old - ang
04. Arabic - ara.
05. Armenian - arm.
06. Byelorussian - bel.
07. Bulgarian - bul.
08. Chechen - che
09. Chinese - chi
10. Check - cze
11. Danish - dan
12. German - deu
13. Dutch - dut
14. Egyptian - egy
15. English - eng
16. Spanish - esl
17. Finnish - fin
18. French - fra
19. French - fre
20. Gaelic - gae
21. German - ger
22. Greek Modern - gre
23. Hebrew - heb
24. Hindi - hin
25. Hungarian - hun
26. Indonesian - ind
27. Irish - iri
28. Italian - ita
29. Japanese - jpn
30. Latin - lat
31. Macedonian - mac
32. Miscellaneous - mis
33. Multiple - mul
34. Norvegian - nor
35. Turkish - ota
36. Persian - per
37. Polish - pol
38. Portuguese - por
39. Romany - rom
40. Romanian - ron
41. Russian - rus
42. Spanish - spa
43. Swedish - swe
44. Swedish - swe
45. Tamil -tam
46. Thai - tha
47. Zuylu - zul

NOTE

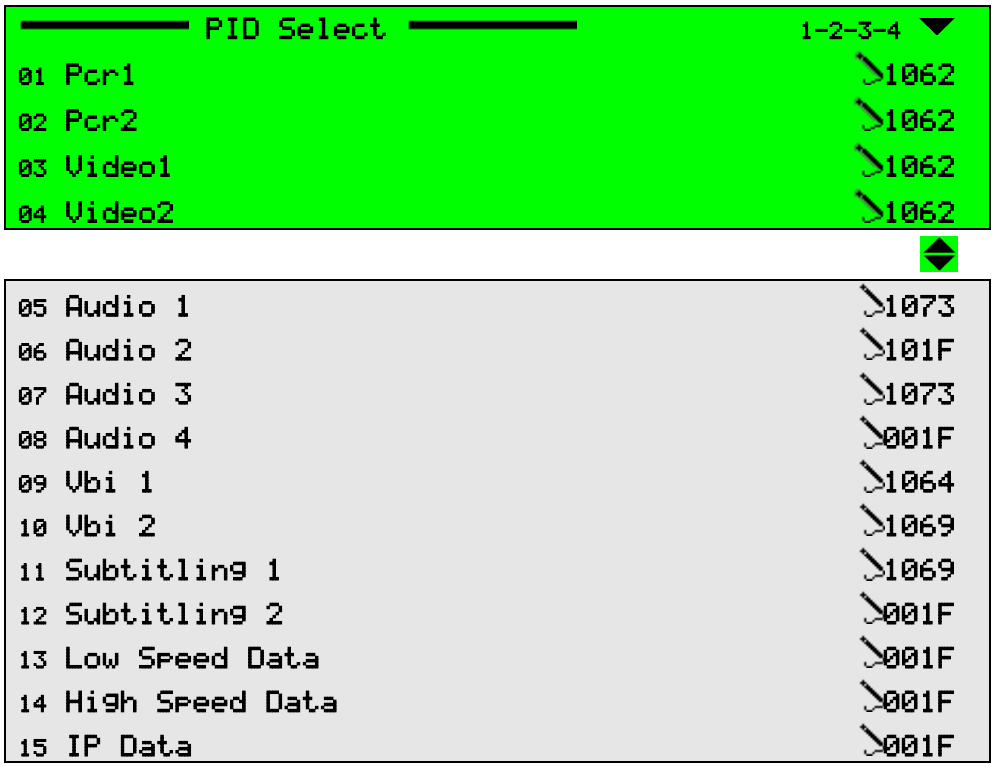
*Option **01. ALL Languages** (default) –*

No specific language is selected. The audio language is set according to the Service PID.

3.3.3.4. PID Select

The **PID Select Menu** enables you to manually assign a PID number to each elementary stream.

The **PID Select Menu** is entered from the IRD Service Configuration Menu (see Paragraph 3.3.3). The following figure displays the PID Select menu:



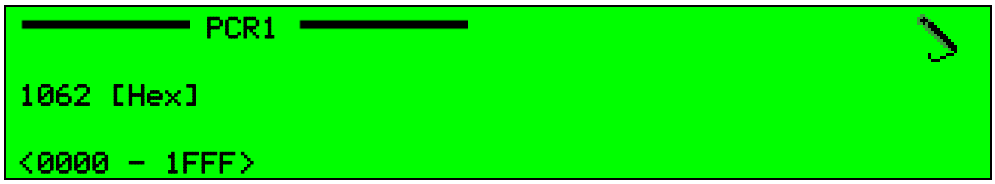
NOTE

*The number of elementary streams provided in the **PID Select Menu** is dynamic and is determined by the IRD-2900 model.*

The **PID Select Service Configuration** Edit Menu screen allows viewing and setting up the PID number for the following elementary streams:

1. **PCR1**
2. **PCR2** (if applicable)
3. **Video1**
4. **Video2** (if applicable)
5. **Audio1/Audio2**
6. **Audio3/Audio4** (if applicable)
7. **VBI1**
8. **VBI2** (if applicable)
9. **Subtitling1**
10. **Subtitling2** (if applicable)
11. **Low Speed Data**
12. **High Speed Data**
13. **IP Data**

Selecting a PID number from the **PID Select Service Configuration** Edit Menu screen displays the following Edit Value screen. It allows viewing and setting a Program Identifier (PID) value for the selected elementary stream:



A. **Top Line** – PID name selected for setup

B. **Next Two lines** – The first line displays the current PID value (Hexadecimal) of the selected elementary stream and enables you to set a new value.
   The second line displays the valid range of set values.

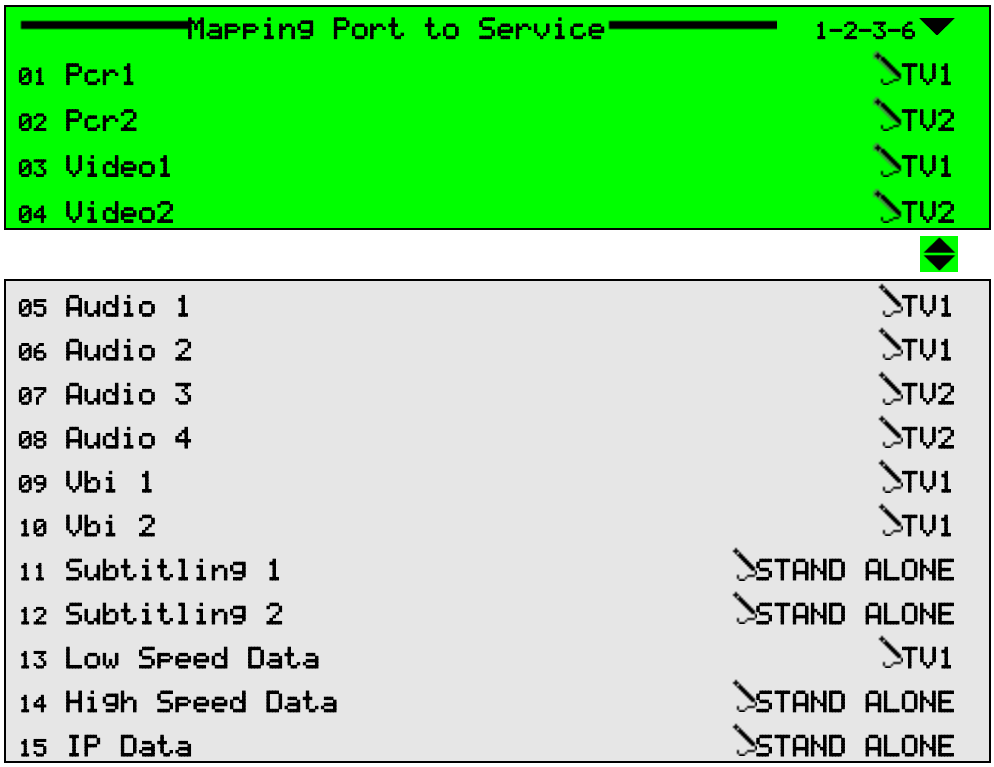
3.3.3.5. Mapping Port to Service

The **Mapping Port to Service Menu** enables you to manually select and configure a service when working with a specific ES table or PMT table.

The **Mapping Port to Service Menu** is entered from the IRD Service Configuration Menu (see Paragraph 3.3.3). The following figure displays the Mapping Port to Service menu:

NOTE

*When selecting the **'Stand-Alone'** option, the service selection is performed manually (not in accordance with the PMT table content).*



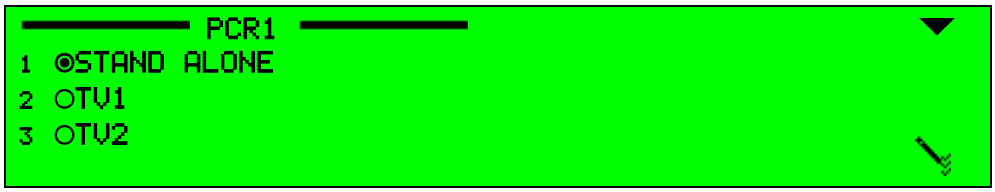
NOTE

*The number of elementary streams provided in the **PID Select Menu** is dynamic and is determined by the IRD-2900 model.*

The **Mapping Port to Service Configuration edit menu screen** allows you to view and set up the services for the following options:

1. **PCR1**
2. **PCR2** (if applicable)
3. **Video1**
4. **Video2** (if applicable)
5. **Audio1/Audio2**
6. **Audio3/Audio4** (if applicable)
7. **VBI1**
8. **VBI2** (if applicable)
9. **Subtitling1**
10. **Subtitling2** (if applicable)
11. **Low Speed Data**
12. **High Speed Data**
13. **IP Data**

Selecting a service from the Mapping Port To Service Configuration Edit Menu screen displays the following Select Value screen. It allows you to view and set the port for the selected service:



A. **Top Line** – Displays the PID name selected for setup

B. **Next Two Lines** – Displays the options available for the parameter

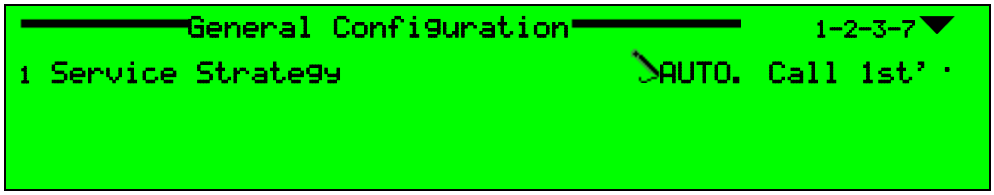
The available options are:

- **Stand Alone** – This mode indicates that you can assign the elementary stream PID. In this mode, the elementary stream is independent of the services selected for decoder#1 and decoder#2.
- **TV1** – This mode indicates that the elementary stream is related to the service assigned to decoder#1.
- **TV2** – This mode indicates that the elementary stream is related to the service assigned to decoder#2.

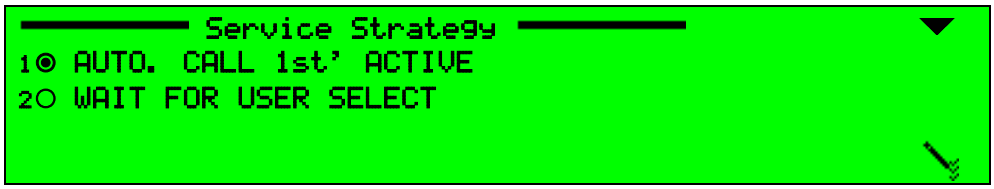
3.3.3.6. General Configuration

The **General Configuration Menu** enables you to configure IRD behavior when locking to a signal.

The **General Configuration Menu** is entered from the IRD Service Configuration Menu (see Paragraph 3.3.3). The following figure displays the General Configuration menu:



- **SERVICE STRATEGY**
  The **Service Strategy** parameter sets the IRD-2900 response to changes in tables or when receiving a new TS.



a. **Top Line** – Displays the name of the Edit Menu

b. **Next Two Lines** – Displays the options available for the parameter

AUTO. Call 1st Active – The IRD locks to the first active service located.

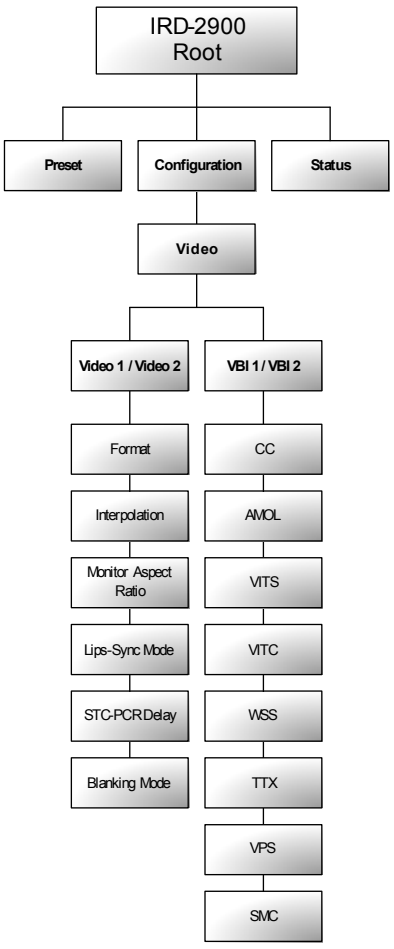
Wait for User Select – The IRD waits for user input to select a service.

3.3.4. Video Configuration Menu

The **Video Configuration Menu** contains parameters that set the video decoder mode of operation.

Figure 3-4 illustrates the IRD **Video Menu Tree** structure and the available options:

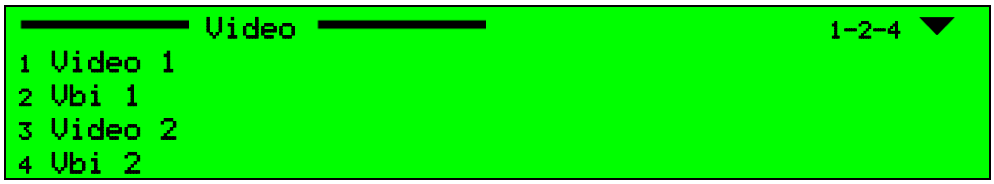
Figure 3-4: Video Menu Tree



NOTE

The number of Video Channel Configurations (as well as the VBI) provided in the Video Configuration menu is dynamic and is determined by the IRD-2900 model.

The **Video Configuration Menu** is entered from the IRD Configuration Main Menu (see Paragraph 3.3) and is displayed in the following menu format:



The Video Configuration parameters are categorized as follows:

A. **Video 1**

This group contains parameters that define the format, lips-sync mode and STC-PCR delay parameters for the video stream for a signal to decoder #1.

For details on the Video 1 Parameter, see Paragraph 3.3.4.1.

B. **VBI 1**

This group contains parameters that define the VBI information for Decoder #1.

For details on the VBI 1 Parameter, see Paragraph 3.3.4.2.

C. **Video 2 (if applicable)**

This group contains parameters that define the format, lips-sync mode and STC-PCR delay parameters for the video stream for a signal to decoder #2.

For details on the Video 2 Parameter, see Paragraph 3.3.4.1.

D. **VBI 2 (if applicable)**

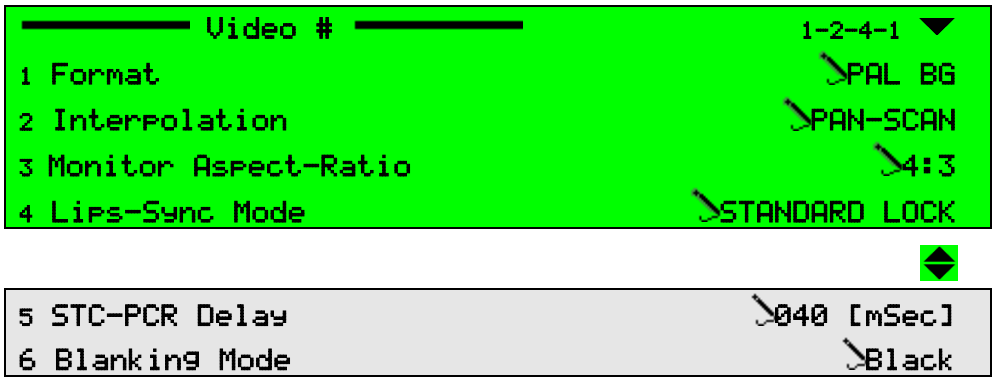
This group contains parameters that define the VBI information for the IRD Decoder #2.

For details on the VBI 2 Parameter, see Paragraph 3.3.4.2.

3.3.4.1. Video 1 and Video 2 Configuration Options

The **Video 1 and Video 2 Menu** contains parameters for Video 1 and Video 2 (if applicable).

These menus are entered from the IRD Video Configuration Menu (see Paragraph 3.3.4). The following figure displays the Video 1 and Video 2 menu:



The available options are:

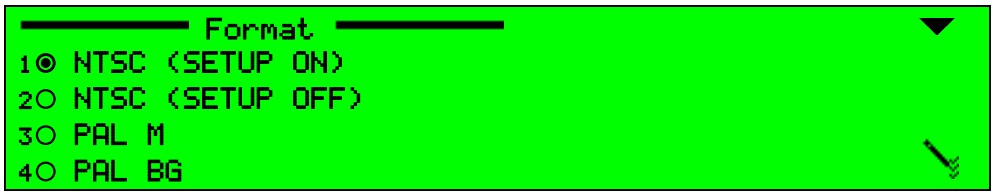
- **Format**
- **Interpolation**
- **Monitor Aspect-Ratio**
- **Lips-Sync Mode**
- **STC-PCR Delay**
- **Blanking Mode**

NOTE

After selecting an option under the Video # menu, the front panel returns to the Video # menu and displays the current selection.

The following paragraphs provide information about Video Configuration options.

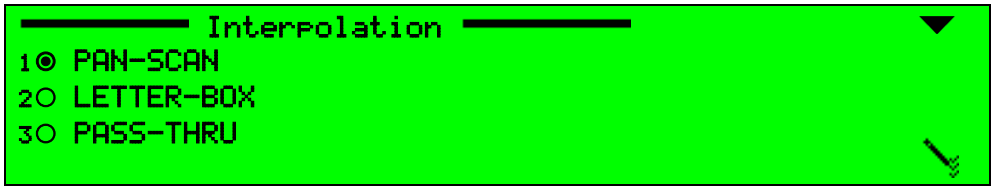
- **FORMAT**
  The **Format** parameter selects the format of the video signal.



The available options are:

NTSC, PAL M, PAL BG, PAL D, PAL N, SECAM, RUSSIAN SECAM**.**

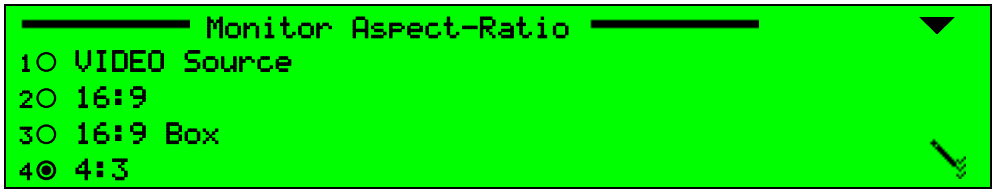
- **INTERPOLATION**
  The **Interpolation** parameter sets the re-sampling method of improving a digital image.



The available options are:

- **Pan-Scan** – The interpolation is set to pan-scan
- **Letter-Box** – The interpolation is set to letter-box
- **Pass-Thru** – The interpolation is set in accordance to the setting of the encoder.

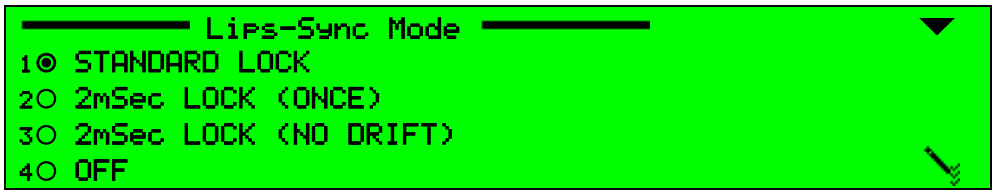
- **MONITOR ASPECT-RATIO**
  The **Monitor Aspect-Ratio** parameter sets the ratio between the width and height of an image.



The available options are:

- **Video Source** – Monitor aspect ratio is determined by the video sequence
- **16:9** – Monitor aspect ratio is set to 16:9
- **16:9 Box** – Monitor aspect ratio is set to 16:9 with letter-box
- **4:3** – Monitor aspect ratio is set to 4:3
- **14:9** – Monitor aspect ratio is set to 14:9
- **14:9 Box** – Monitor aspect Ratio is set to 14:9 with letterbox

- **LIPS-SYNC MODE**
  The **Lips-Sync** parameter selects the IRD lips-sync mode of operation.



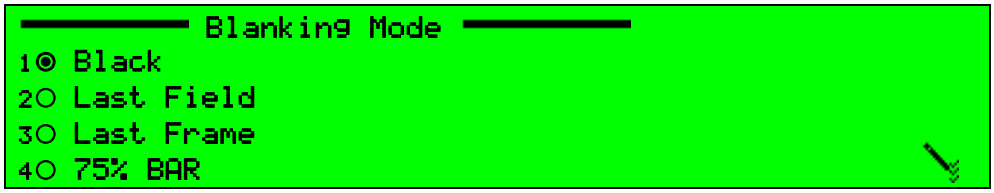
The available options are:

- **Standard Delay** – Standard sync of video and audio data within ±40mSec
- **2m sec DELAY (ONCE)** – Sync audio to video within ±2 mSec. In this mode, the IRD synchronize the audio to the video only once, monitoring audio sync to video stops.
- **2m sec DELAY (NO DRIFT)** – Sync audio to video within ±2 mSec. In this mode, the IRD continuously monitor the audio sync to video to maintain synchronization within ±2 mSec.
- **OFF** – No "lips" synchronization

- **STC-PCR DELAY**
  The **STC PCR Delay** parameter sets the delay between the System Time Clock (STC) and the IRD clock. The IRD clock is recovered from PCR data to compensate for:
  - Delay between STC and PCR
  - Correctly processing the Presentation Time Setup (PTS)
  - Preventing a buffer underflow

Available delay range is a number from 0 to 200 mSec.

- **BLANKING MODE**
  The **Blanking Mode** parameter sets the display mode of a service when reception stops.



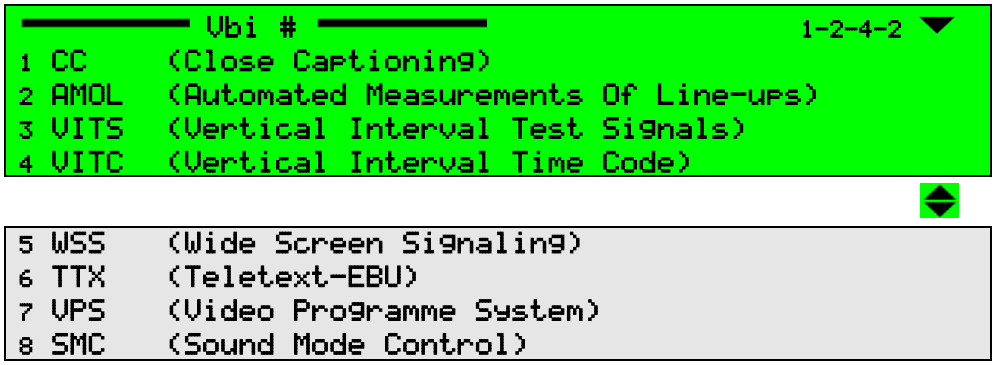
The available options are:

- **Black** – the video output will be a black screen
- **Last Field** – the video output will be the last field
- **Last Frame** – the video output will be the last frame
- **75% BAR** – the video output will be a colour bar

3.3.4.2. VBI 1 and VBI 2

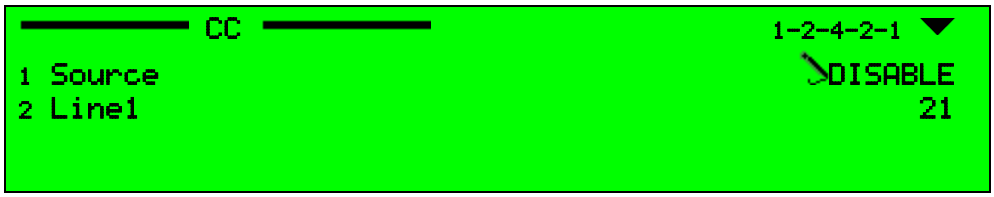
The **VBI 1 and VBI 2 Menu** contains parameters that define the IRD VBI re-insertion mode of operation.

The VBI 1 and VBI 2 Menu is entered from the IRD Video Configuration Menu (see Paragraph 3.3.4). The following figure displays the VBI 1 and VBI 2 menu:

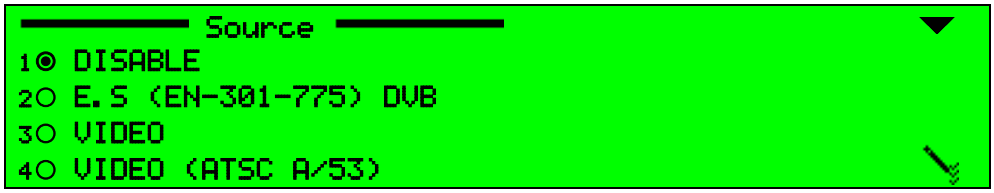

Vbi #
1-2-4-2
1 CC (Close Captioning)
2 AMOL (Automated Measurements Of Line-ups)
3 VITS (Vertical Interval Test Signals)
4 VITC (Vertical Interval Time Code)
5 WSS (Wide Screen Signaling)
6 TTX (Teletext-EBU)
7 VPS (Video Programme System)
8 SMC (Sound Mode Control)

The following paragraphs provide information about the **VBI Configuration** options.

- **CC (CLOSED CAPTION) PARAMETER**
  When the **Closed Caption (CC) VBI** parameter is selected, the following screen is displayed:



When selecting the **Source** option, the following screen is displayed:



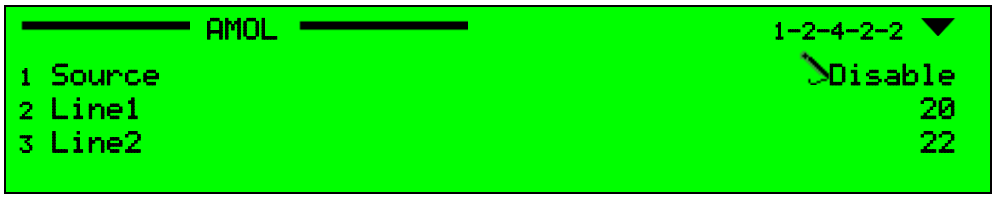
The available options are:

- **DISABLED** – CC is disabled.
- **E.S (EN-301-775)** – The IRD complies with the DVB EN 301-775 CC standard.
- **VIDEO** – The IRD automatically detects which CC standard exists in the transport stream. The IRD supports the following CC standards:
  - CCube standard
  - Harmonic Divicom standard
  - ATSC DVS-53 (Rev 57) EIA 608
  - ATSC DVS-53 (Rev 57) caption type 4
  - GI DVS-157
- **VIDEO (ATSC A/53)** – The IRD automatically detects which CC standard exists in the transport stream starting with the ATSC standard. The IRD supports the following CC standards:
  - CCube standard
  - Harmonic Divicom standard
  - ATSC DVS-53 (Rev 57) EIA 608
  - ATSC DVS-53 (Rev 57) caption type 4
  - GI DVS-157

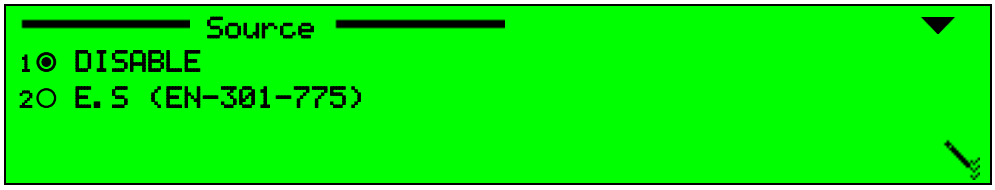
NOTE

CC is re-inserted to line 21, thus this parameter is not editable.

- **AMOL (AUTOMATIC MEASUREMENTS OF LINE-UPS)**
  When the **Automatic Measurements Of Line-ups (AMOL) VBI** parameter is selected, the following screen is displayed:



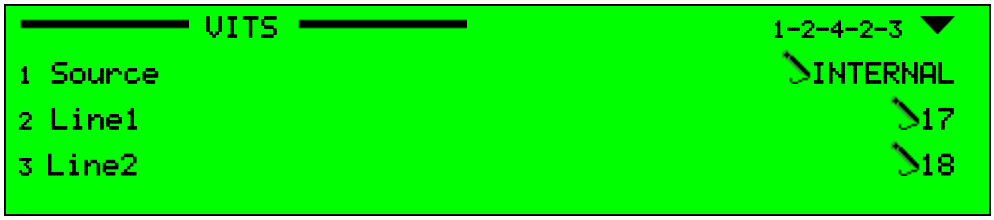
When selecting the **Source** option, the following screen is displayed:



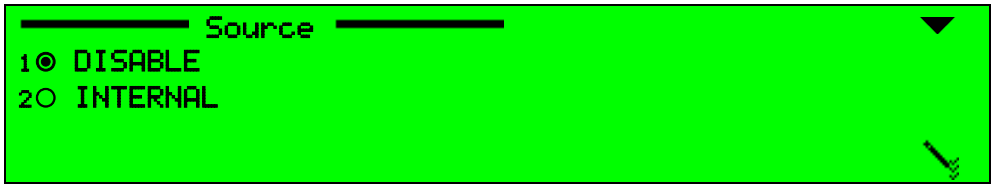
The available options are:

- **Disabled** – AMOL is disabled.
- **E.S (EN-301-775)** – The IRD complies with DVB EN 301-775 AMOL standard.

- **VITS (VERTICAL INTERVAL TEST SIGNALS) PARAMETER**
  When the **VBI Vertical Interval Test Signals (VITS)** parameter is selected, the following screen is displayed:



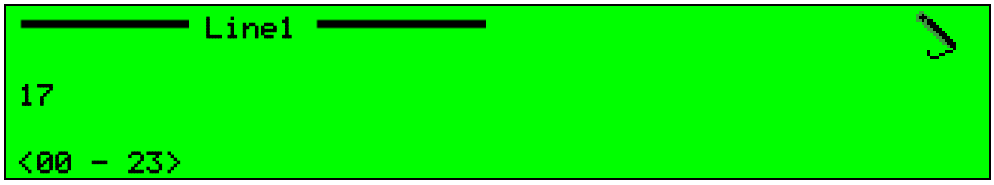
When selecting the **Source** option, the following screen is displayed:



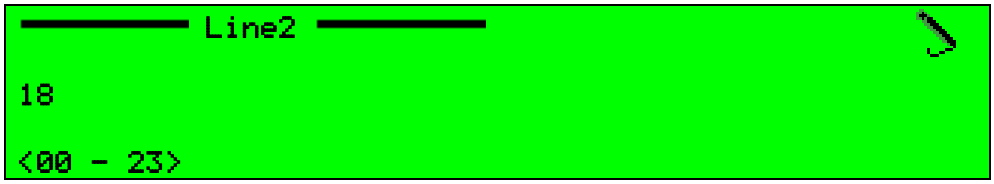
The available options are:

- **DISABLED** – VITS is disabled.
- **INTERNAL** – The IRD inserts the VITS signal in accordance with ITU-T standard J. 63.

When selecting the **Line 1** option, the following screen is displayed:

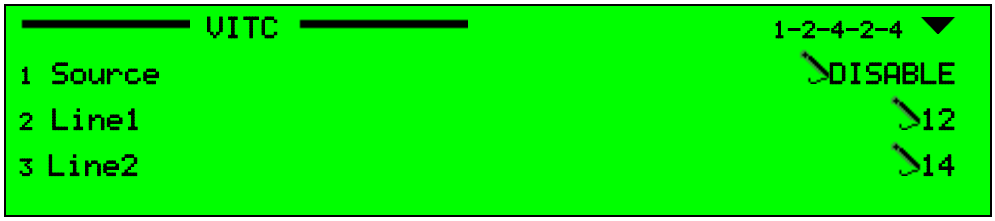


When selecting the **Line 2** option, the following screen is displayed:

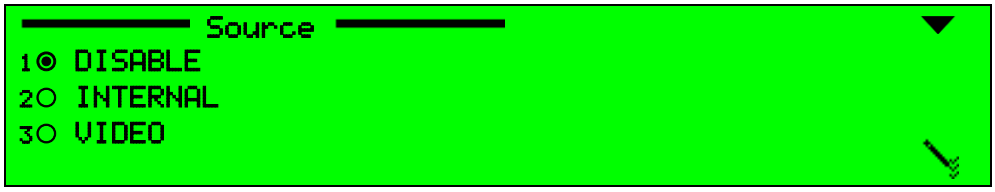


The VITS signal is inserted differently if using PAL or NTSC. When selecting PAL, VITS signals are inserted to lines 17 and 18 and to lines 330 and 331. When selecting NTSC, VITS signals are inserted to line 17-field 1 and line 17-field 2. The IRD enables the insertion of VITS signals to lines 17 and 18 as well as to any other line between 0 and 23.

- **VITC (VERTICAL INTERVAL TIME CODE) PARAMETER**
  When the **Vertical Interval Time Code (VITC) VBI** parameter is selected, the following screen is displayed:



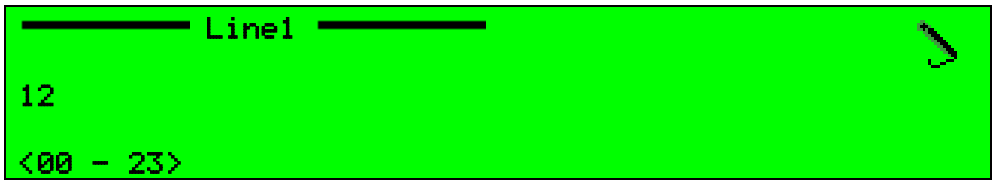
When selecting the **Source** option, the following screen is displayed:



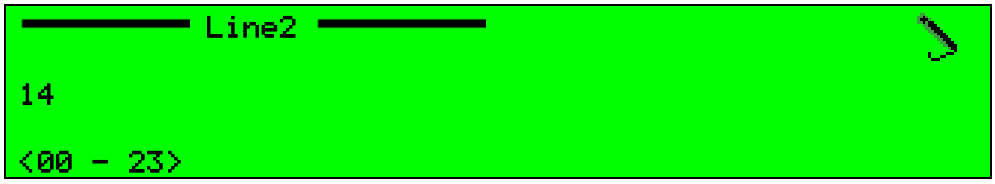
The available options are:

- **Disabled** – VITC is disabled.
- **Internal** – The IRD re-inserts the IRD uptime.
- **Video** – The IRD re-inserts the VITC signal as included in the transport stream.

When selecting the **Line 1** option, the following screen is displayed:

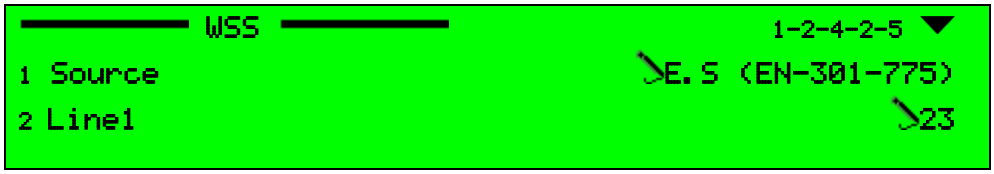


When selecting the **Line 2** option, the following screen is displayed:

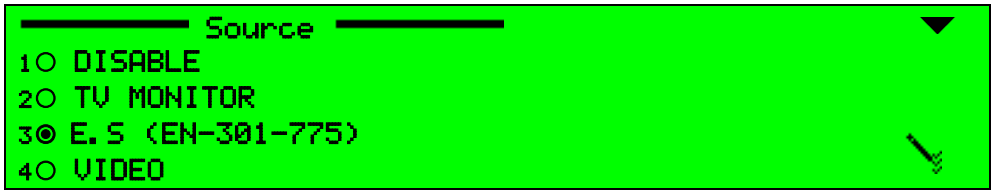


The IRD allows inserting VITC to any line between 0 and 23.

- **WSS (WIDE SCREEN SIGNALING) PARAMETER**
  When the **Wide Screen Signaling (WSS) VBI** parameter is selected, the following screen is displayed:



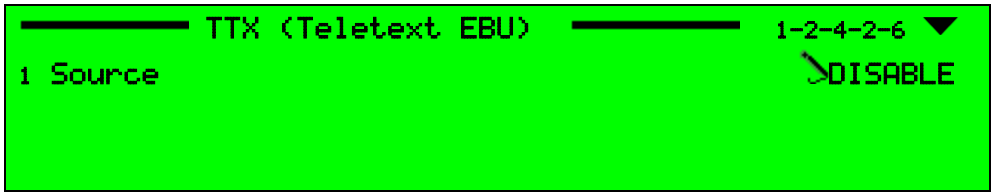
When selecting the **Stream** option, the following screen is displayed:



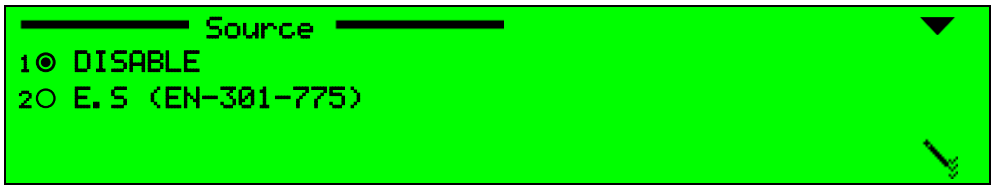
The available options are:

- **DISABLE** – Wide Screen Signalling is disabled.
- **TV MONITOR** – Inserts the WSS signal in accordance with ITU-T standard J. 63.
- **E.S. (EN-301-775)** – Complies with DVB EN 301-775 WSS standard.
- **VIDEO** – The IRD re-inserts the WSS signal as included in the transport stream.

- **TTX (TELETEXT-EBU) PARAMETER**
  When the **Teletext-EBU (TTX) VBI** parameter is selected, the following screen is displayed:



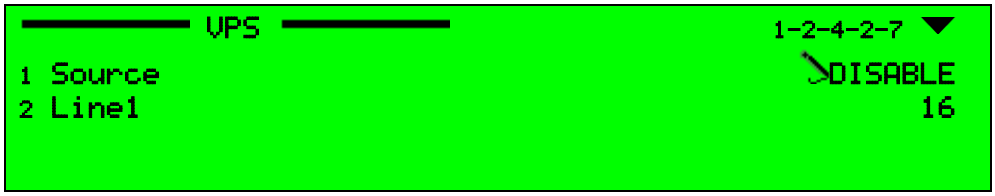
When selecting the **Source** option, the following screen is displayed:



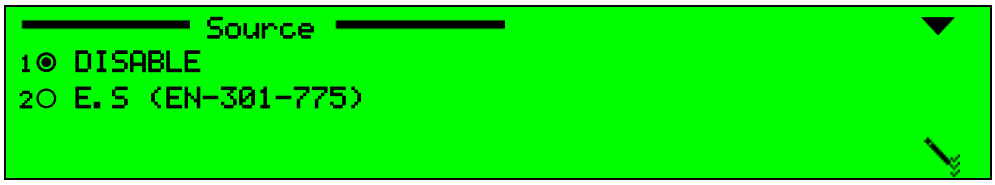
The available options are:

- **DISABLED** – Teletext is disabled.
- **E.S (EN-301-775)** – The IRD re-inserts the Teletext signal as included in the transport stream in accordance with EN 301-775.

- **VPS (VIDEO PROGRAM SYSTEM) PARAMETER**
  When the **Video Program System (VPS) VBI** parameter is selected, the following screen is displayed:



When selecting the **Source** option, the following screen is displayed:



The available options are:

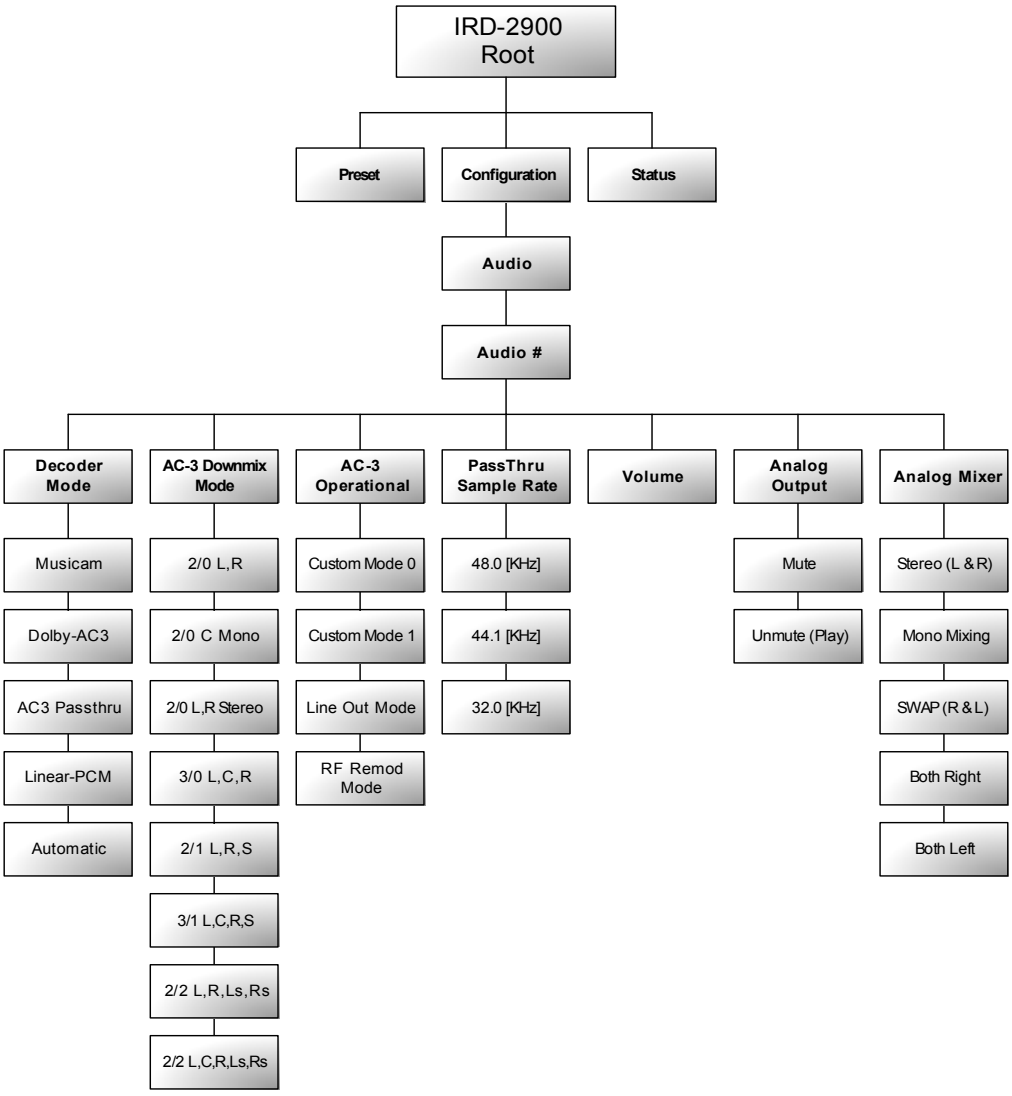
- **DISABLED** – VPS is disabled.
- **E.S (EN-301-775)** – The IRD re-inserts the signal as included in the transport stream in accordance with EN 301-775.

3.3.5. Audio Configuration Menu

The **Audio Configuration Menu** contains parameters that define the audio decoder mode of operation.

Figure 3-5 illustrates the IRD **Audio Menu Tree** structure and the available options:

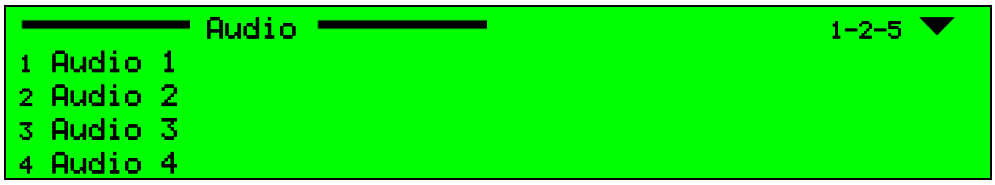
Figure 3-5: Audio Menu Tree



NOTE

The number of Audio Channel Configurations provided in the Audio Configuration menu is dynamic and is set by the configuration of the IRD-2900 unit.

The **Audio Configuration Menu** is entered from the **IRD Configuration Main Menu** (see Paragraph 3.3) and is displayed in the following menu format:



The **Audio Configuration Menu** parameters are all categorized the same:

A. **Audio 1**

This group contains parameters that define the setup of the audio decoder mode, AC3 downmix mode, AC3 operational, Pass-through sample rate, volume, analog output, and analog mixing.

For details on the Audio 1 Parameter, see Paragraph 3.3.5.1.

B. **Audio 2** (if applicable)

This group contains parameters that define the setup of the audio decoder mode, AC3 downmix mode, AC3 operational, Pass-through sample rate, volume, analog output, and analog mixing.

For details on the Audio 2 Parameter, see Paragraph 3.3.5.1.

C. **Audio 3** (if applicable)

This group contains parameters that define the setup of the audio decoder mode, AC3 downmix mode, AC3 operational, Pass-through sample rate, volume, analog output, and analog mixing.

For details on the Audio 3 Parameter, see Paragraph 3.3.5.1.

D. **Audio 4** (if applicable)

This group contains parameters that define the setup of the audio decoder mode, AC3 downmix mode, AC3 operational, Pass-through sample rate, volume, analog output, and analog mixing.

For details on the Audio 4 Parameter, see Paragraph 3.3.5.1.

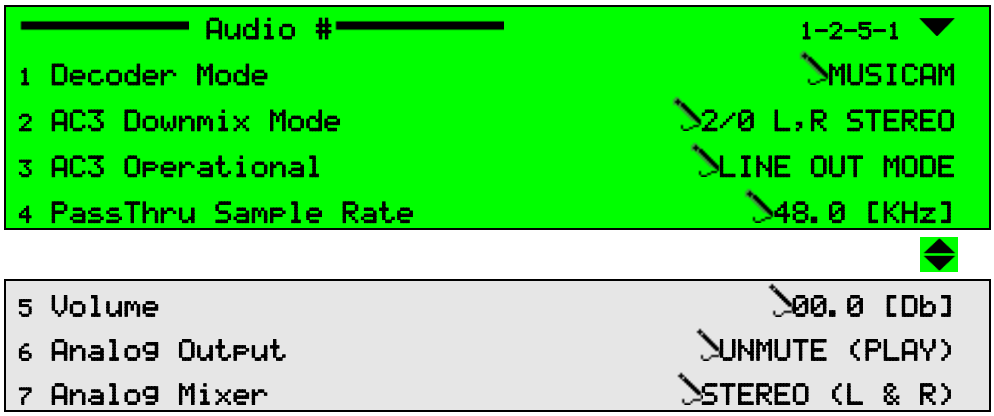
3.3.5.1. Audio

NOTE

The following descriptions and options are applicable for all Audio channels.

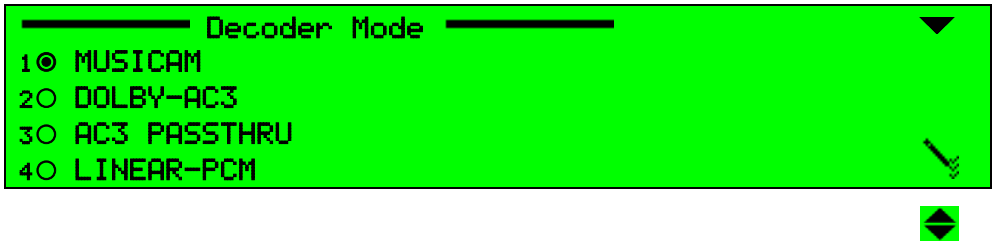
The **Audio Menu** contains and defines parameters for an audio channel.

The **Audio Menu** is entered from the IRD Audio Configuration Menu (see Paragraph 3.3.5). The following figure displays the Audio menu:



The following paragraphs provide information about the Audio Configuration options.

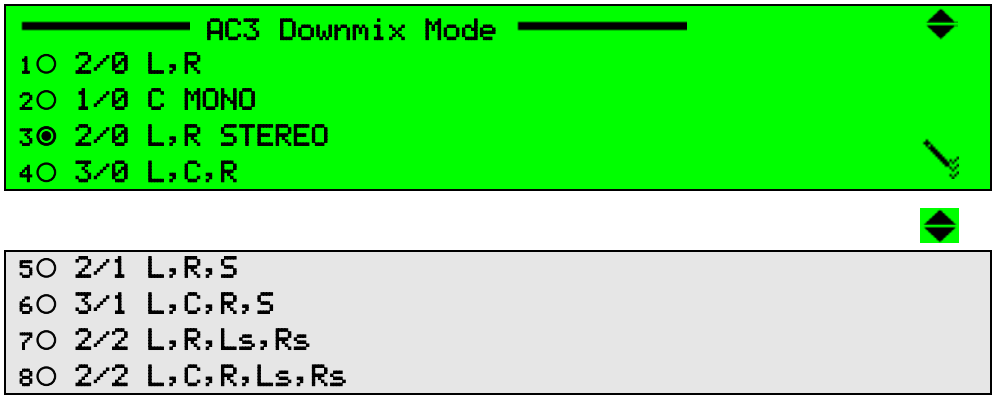
- **AUDIO DECODER MODE SETUP**
  The **Audio Decoder** mode option allows you to set the following parameters for an Audio channel:



  This menu controls the decoder audio mode; **the available options are:**

  - **MUSICAM** – Sets the audio decoder mode to MUSICAM
  - **Dolby-AC3** – Sets the audio decoder mode for the AC-3 downmix
  - **AC3 Passthru** – Sets the audio decoder mode to AC-3 Pass-through
  - **Linear-PCM** – Sets the audio decoder mode to Linear PCM and Dolby E Pass-through
  - **Automatic** – Automatically detects the audio decoding mode

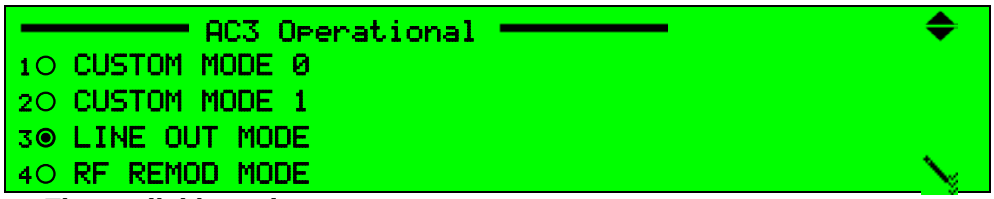
- **AC3 DOWNMIX MODE SETUP**
  The **AC-3 Downmix** mode allows you to set the downmix mode to 2/0.



  The available options are:

  - **2/0 L, R**
  - **2/0 C mono**
  - **2/0 L, R stereo**
  - **3/0 L, C, R**
  - **2/1 L, R, S**
  - **3/1 L, C, R, S**
  - **2/2 L, R, Ls, Rs**
  - **2/2 L, C, R, Ls, Rs**

- **AUDIO AC3 OPERATIONAL SETUP**
  The **Audio AC3 Operational** parameter selects the audio output mode of operation on a specific audio for the Dolby AC-3 processed audio information (for example, Audio 1 output).



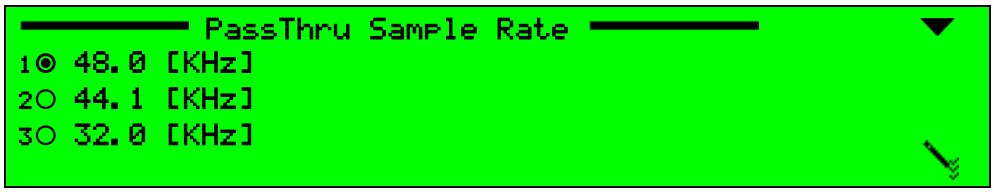
The available options are:

- **Custom Mode 0**
- **Custom Mode 1**
- **Line Out Mode**
- **RF Remod Mode**

NOTE

The default for Audio AC-3 Operational output is Line Out Mode.

- **PASSTHRU SAMPLE RATE**
  The **Passthru Sample Rate** parameter allows you to set the sampling frequency for the AC3 Pass-through.



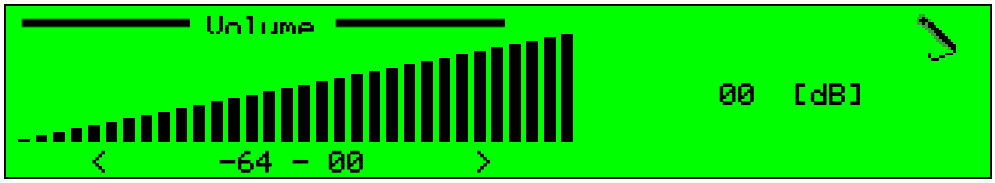
The available options are:

- **48.0 [KHz]**
- **44.1 [KHz]**
- **32.0 [KHz]**

- **VOLUME**

The **Volume** parameter allows you to set the audio volume of the audio channel.

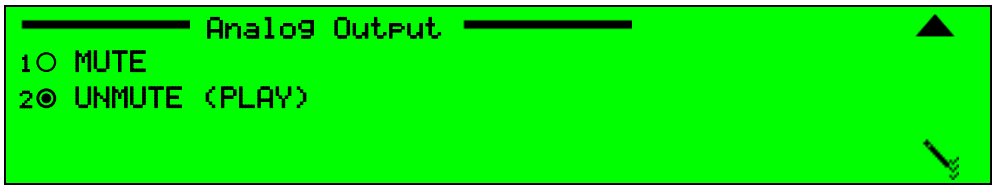
A graphical volume display illustrates the volume level.



The available range is a value between –64 and 0.

- **ANALOG OUTPUT**

The **Analog Output** parameter sets mute or play mode in an audio channel output.

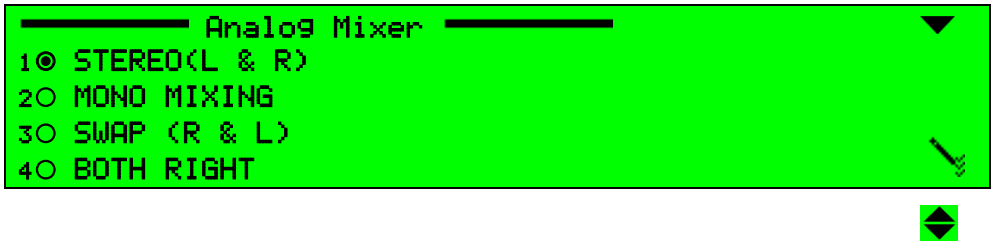


The available options are:

- **Mute** – Silences the analog audio signal in a specific audio channel (for example Audio 1).
- **Unmute (play)** – The current analog audio is heard on a specific audio channel (for example Audio 1).

- **ANALOG MIXER**

The **Analog Mixer** parameter allows setting the stereo and mono options of the stereo channels.



The available options are:

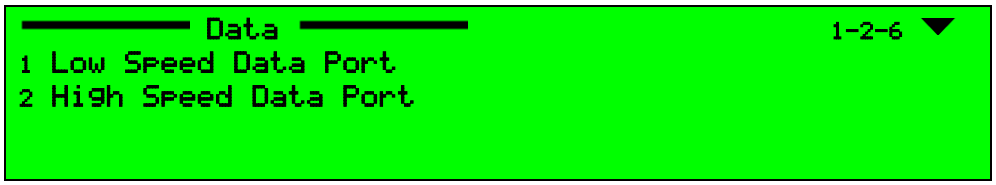
- **Stereo (L & R)** – Standard stereo output on the respective left and right connectors
- **Mono Mixing** – Mixes left and right stereo channel signals for mono output on both left and right connectors
- **Swap (R & L)** – Swaps channels:
  -Left channel on right connectors
  -Right channel on left connectors
- **Both Right** – Outputs right channels on both left and right connectors
- **Both Left** – Outputs left channels on both left and right connectors

3.3.6. Data Configuration Menu

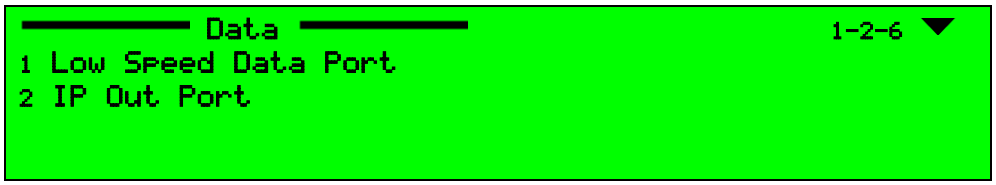
The **Data Configuration Menu** allows setting parameters to handle a data output stream.

The Data Configuration Menu is entered from the IRD Configuration Main Menu (see Paragraph 3.3).

High Speed Data Port is supported in IRD-2960 and IRD-2990 models. The Data Configuration Menu is displayed as follows:



IP-Out-Port is supported in all IRD-2900 models, except for the IRD-2960 and IRD-2990 models. The Data Configuration Menu is displayed as follows:



The **Data Configuration Menu** parameters are categorized as follows:

- **Low Speed Data Port**
  Contains parameters that allow setting filtering mode to Low Speed Data (LSH PID) information. For details, see Paragraph 3.3.6.1.
- **High Speed Data Port**
  Contains parameters that allow setting filtering mode to High Speed Data (HSD PID) information. For details, see Paragraph 3.3.6.2.
- **IP Out Port**
  Contains parameters that define the IP-Out-Port mode of operation as well as parameters required for MPEGoIP and IPoMPEG (MPE) operations. For details, see Paragraph 3.3.6.3.

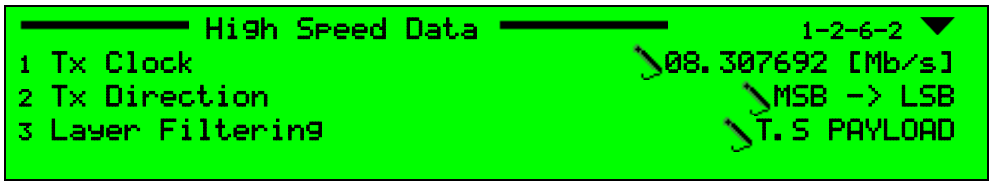
3.3.6.1. Low Speed Data Port

This feature will be supported in future software release.

3.3.6.2. High Speed Data

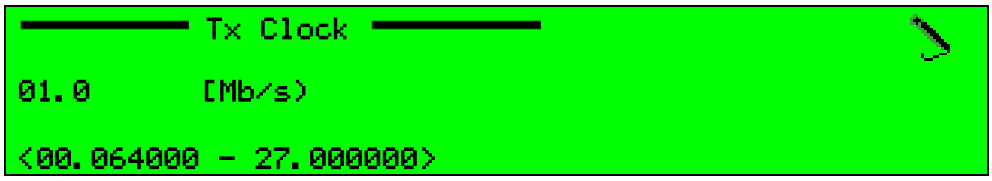
The **High Speed Data Menu** selects the filtering applied to the High Speed Data (HSD PID) information.

The **High Speed Data Menu** is entered from the IRD Data Configuration Menu (see Paragraph 3.3.6). The following figure displays the High Speed Data menu:



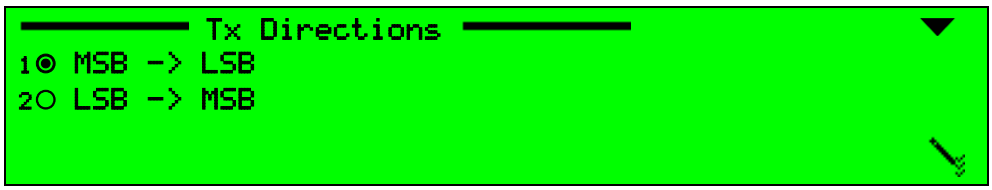
The following paragraphs provide information about the **High Speed Data Configuration** options.

- **TX CLOCK**
  The **Tx Clock** parameter sets the speed of the high speed data port.



  The available range is a value between 00.064000 and 27.000000.

- **TX DIRECTION**
  The **Tx Direction** parameter defines whether MSB or LSB is sent first.



  The available options are:

  - **MSB → LSB** – MSB sent first
  - **LSB → MSB** – LSB sent first

- **LAYER FILTERING**
  The **Layer Filtering** parameter selects filtering mode to data.

The available options are:

- **P.E.S Payload** – Strips the header of the packetized elementary stream (PES).
- **T.S Payload** – Strips the transport stream header (first 4 bytes out of the 188 bytes packet)
- **T.S Packet** – Enables the entire transport stream packet (188 bytes)

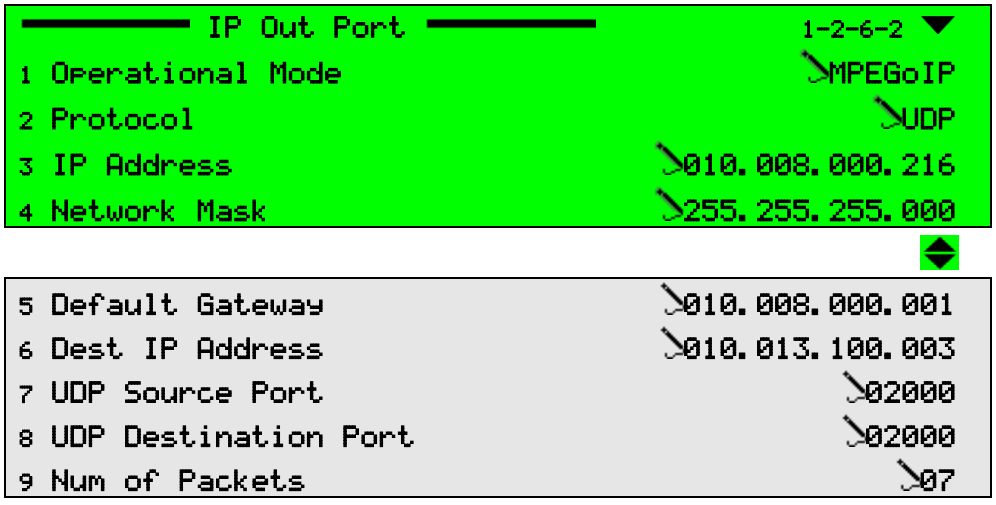
3.3.6.3. IP-Out-Port Configuration Menu

NOTE

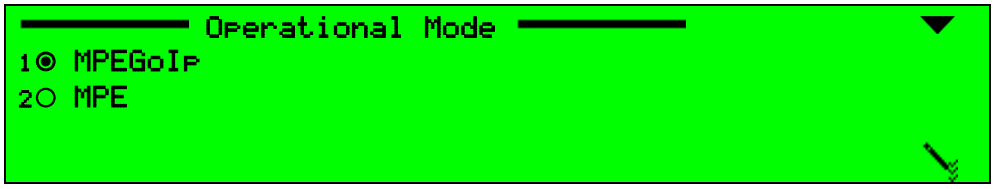
When selecting MPE mode you must verify that the MPE encapsulator setup is such that the MPEG packet contains data of a single IP frame (for example, a single MPEG packet cannot contain data belonging to two separate IP frames).

The **IP-Out-Port Menu** enables configuring the parameters of the IP-Out-Port.

The **IP-Out-Port Menu** is entered from the IRD Data Configuration Menu (see Paragraph 3.3.6). The following figure displays the IP-Out-Port menu:



- **OPERATIONAL MODE**
  Displays the currently active mode of operation and allows setting the mode required (using the following Select Value screen).



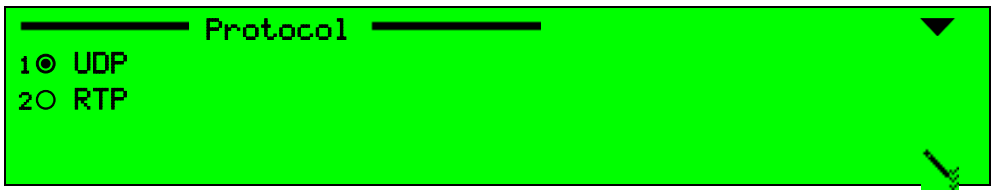
The available options are:

- **MPEGoIp** – MPEG-over-IP mode
- **MPE** – IP data (MPE de-capsulation)

NOTE

When Operational mode is set to MPEG-over-IP, all other items in the IP-Out-Port menu must be configured. When the Operational mode is set to MPE, then the IP address, Subnet Mask, and Default Gateway items must be configured.

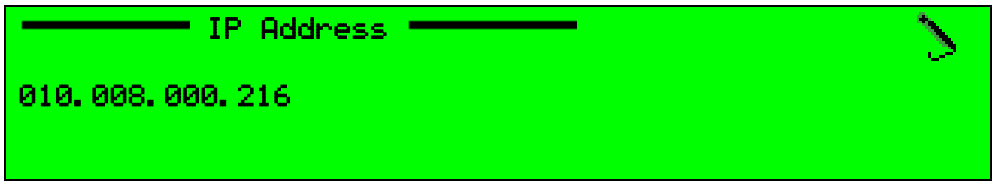
- **PROTOCOL**
  Displays the currently active L3 protocol and allows setting the required protocol (using the following Select Value screen).



The available options are:

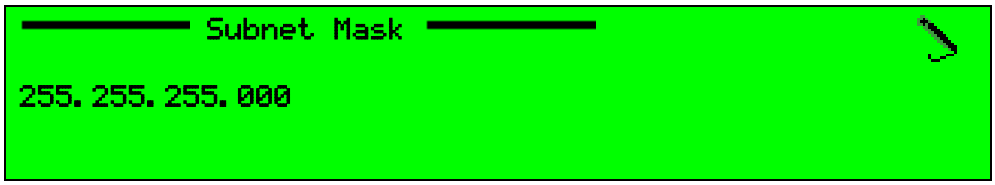
- **UDP** – User Datagram Protocol
- **RTP** – Real Time Protocol (this feature will be supported in future software releases)

- **IP ADDRESS**
  The **IP Address** parameter allows setting the IP Address of the output port.



  The value in each field must be a number between 0 and 255.

- **SUBNET MASK**
  The **Subnet Mask** parameter defines the network sub-mask.



  The value in each field must be a number between 0 and 255.

- **DEFAULT GATEWAY**
  The **Default Gateway** parameter allows setting the network default gateway address. This is the address of a local IP router on the same network as the IRD-2900 that is used to forward traffic beyond the local network.

  The value in each field must be a number between 0 and 255.

- **DESTINATION IP ADDRESS**
  The **Destination IP Address** parameter allows setting the required destination IP address.

  The value in each field must be a number between 0 and 255.

- **UDP SOURCE PORT**
  The **UDP Source Port** parameter allows setting the source UDP port number.

The value is a number between 0 and 65535.

- **UDP DESTINATION PORT**
  The **UDP destination Port** parameter allows setting the UDP Destination port number.

The value is a number between 0 and 65535.

- **NUMBER OF PACKETS**
  The **Number of Packets** parameter allows setting the number of MPEG packets to be contained in an IP frame (using the following Edit Value Screen).

The available range is a value between 0 and 7.

3.3.7. Conditional Access Configuration Menu

The **Conditional Access Configuration Menu** allows setting the configuration options for the Conditional Access function.

The Conditional Access Configuration Menu is entered from the IRD Configuration Main Menu (see Paragraph 3.3) and is displayed in the following menu format:

The **Conditional Access Menu** parameters are categorized as follows:

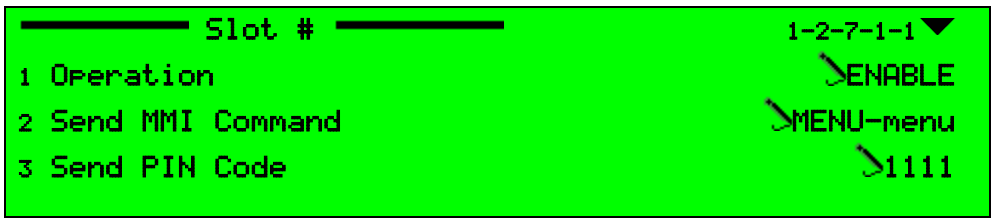
- **Common Interface (CI)**
  Enable setting up the configuration of the CAMS in the IRD using the DVB-CI standard. For details see Paragraph 3.3.7.1.
- **BISS Mode**
  Enable setting up the BISS encryption mode. For details see Paragraph 3.3.7.2.
- **Embedded Mode**
  Enable setting up the embedded encryption mode. For details see Paragraph 3.3.7.3.

3.3.7.1. Common Interface Configuration Menu

The **Common Interface (CI)** menu displays the current status of the IRD-2900 CI slots.

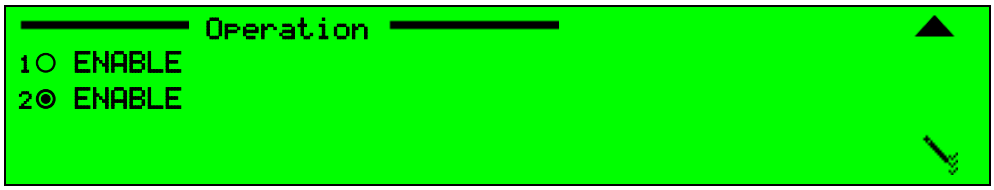
The **Common Interface** menu is entered from the IRD Conditional Access menu (see Paragraph 3.3.7). The following Menu Navigation screen contains parameters defining which CI slot parameters must be displayed and set up:

Once a CI Slot is selected, an Edit Menu screen is displayed. The **Slot 1 and Slot 2 Configuration edit menu** provides access to the CI parameters for the respective IRD CI Slot:



The following paragraphs provide information about the **Slot Configuration** options.

- **OPERATION**
  The **Operation** parameter enables or disables the slot.

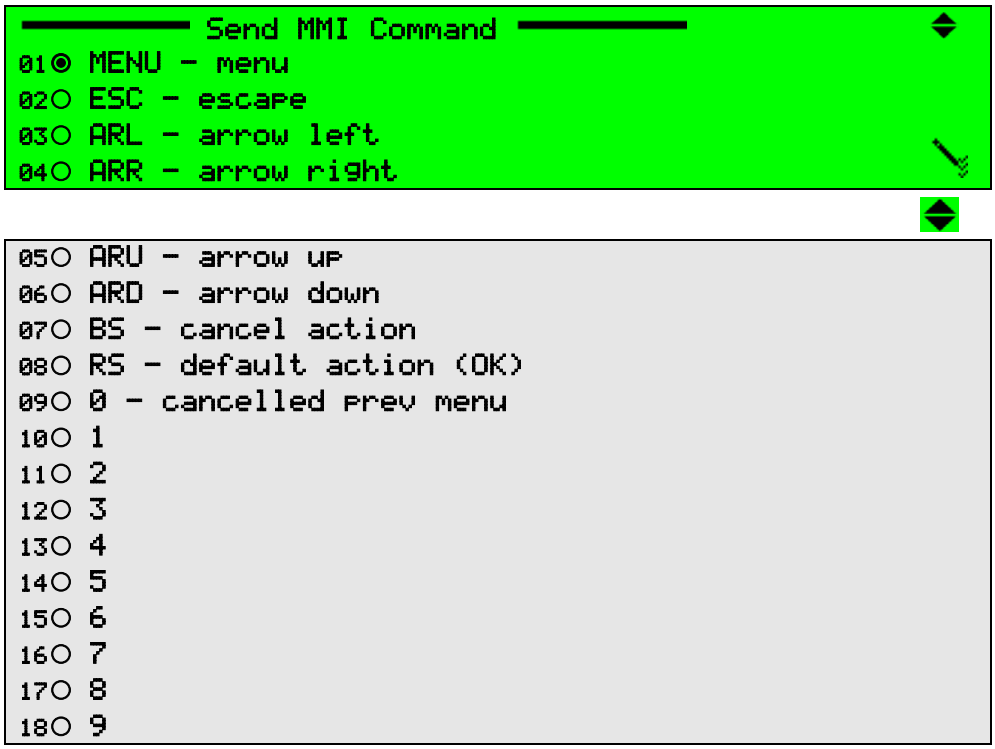


The available options are:

- **Enable**
- **Enable**

- **SEND MMI (MAN-MACHINE INTERFACE) COMMAND**
  The **Send MMI Command** sets and sends the MMI command to the CAM installed in the CI slot. This MMI contains a set of commands that can be sent to the CA application in the Conditional Access Module (CAM).

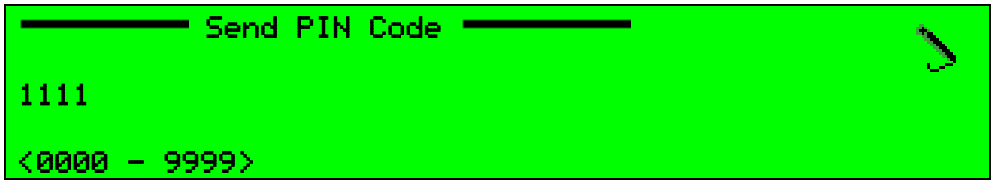
  The CAM response is displayed either on the CLI or using OSD on the video monitoring port.



The available options are:

Menu (menu); **ESC** (escape); **ARL** (arrow left); **ARR** (arrow right); **ARU** (arrow up); **ARD** (arrow down); **BS** (cancel action), **RS** (default action), **0-9 digits**

- **SEND PIN CODE**
  The **Send PIN Code** parameter allows setting and sending a PIN code to the CAM.



3.3.7.2. BISS Mode

This feature will be supported in future software releases.

3.3.7.3. Embedded Mode

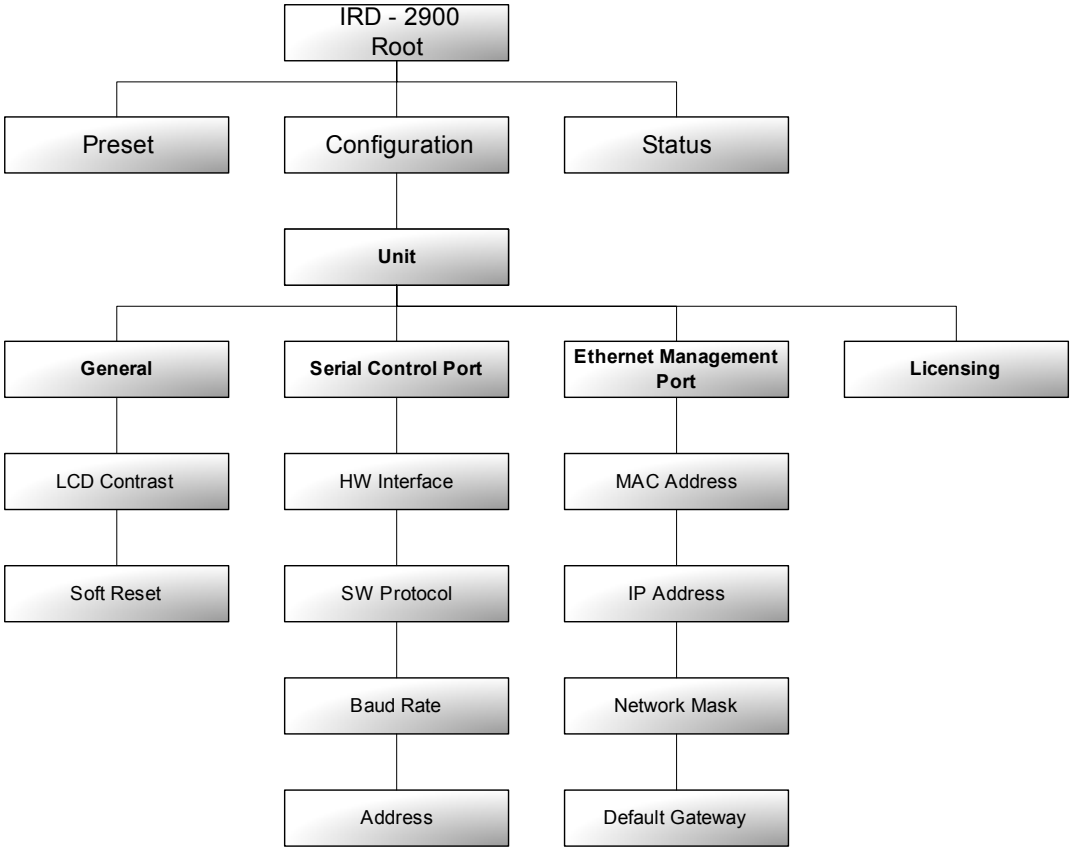
This feature will be supported in future software releases.

3.3.8. Unit Configuration Menu

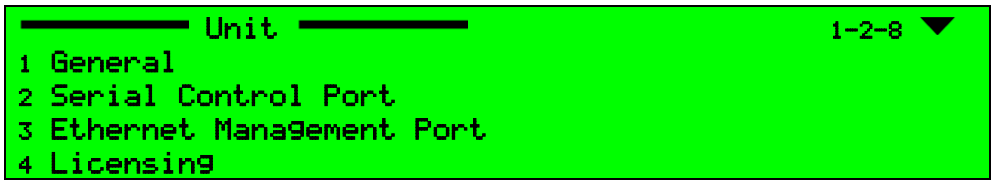
The **Unit Configuration Menu** allows setting general IRD parameters.

Figure 3-6 illustrates the **IRD Unit Menu Tree** structure and the available options:

Figure 3-6: Unit Menu Tree



The **Unit Configuration Menu** is entered from the **IRD Configuration Main Menu** (see Paragraph 3.3) and is displayed in the following menu format:



The **Unit Configuration Menu** parameters are categorized as follows:

A. **General**

Allow you to set the LCD contrast value and performing soft reset (see Paragraph 3.3.8.1).

B. **Serial Control Port**

Allow you to configure the control port parameters (see Paragraph 3.3.8.2).

C. **Ethernet Management Port**

Allow you to configure the IRD's Ethernet management port (see Paragraph 3.3.8.3).

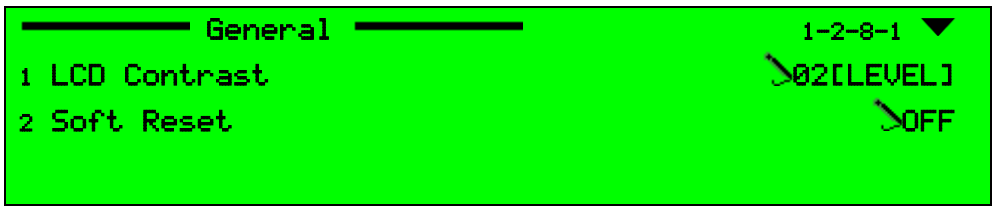
D. **Licensing**

Allow you to activate features that require a software license (see Paragraph 3.3.8.4).

3.3.8.1. Unit General Configuration Menu

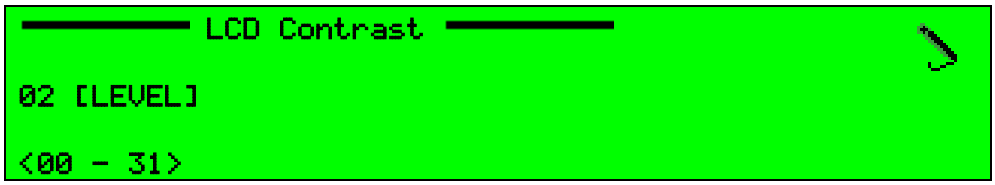
The **Unit General Menu** adjusts the LCD contrast level and provides a soft reset for the device.

The **Unit General Menu** is entered from the IRD Unit Configuration Menu (see Paragraph 3.3.8). The following figure displays the Unit General menu:



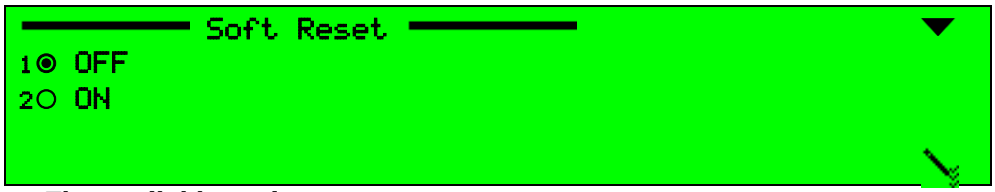
The following paragraphs provide information about the **Unit General Configuration** options.

- **LCD CONTRAST**
  The **LCD Contrast** option sets the IRD-2900 LCD contrast.



The available range is a value between 0 and 31, where 0 is the lightest and 31 is the darkest.

- **SOFT RESET**
  The **Soft Reset** option restarts the IRD-2900.



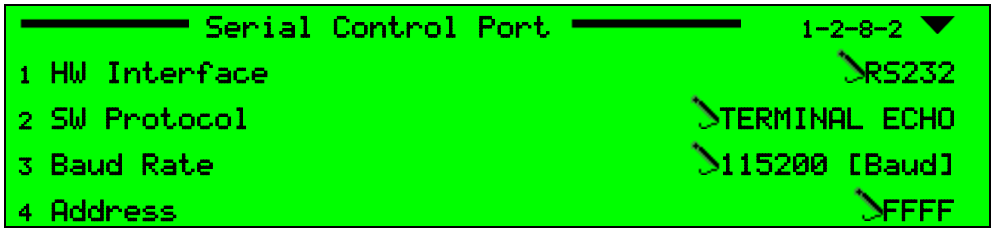
The available options are:

- **OFF**
- **ON** – Activates soft reset

3.3.8.2. Serial Control Port Configuration

The **Serial Control Port Menu** allows you to set the serial control port parameters.

The **Serial Control Port Menu** is entered from the IRD Unit Configuration Menu (see Paragraph 3.3.8). The following figure displays the Serial Control Port menu:



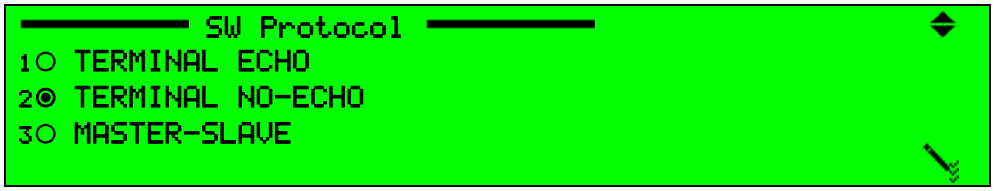
The following paragraphs provide information about the **Unit Serial Control Port** configuration options.

- **HW INTERFACE**

The available options are:

- **RS-232**
- **RS-485**

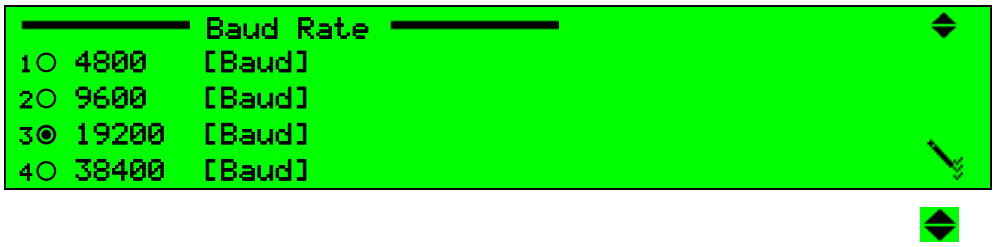
- **SW PROTOCOL**



The available options are:

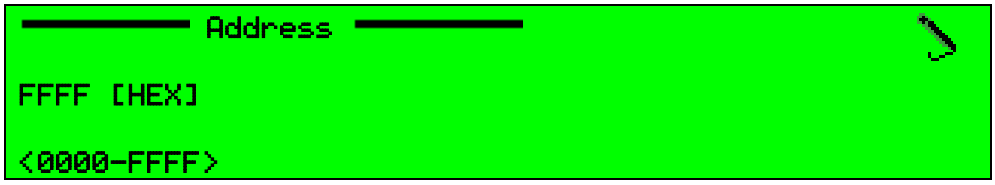
- **Terminal Echo**
- **Terminal No-Echo**
- **Master-Slave**

- **BAUD RATE**



The available options are:
4800, 9600, 19200, 38400, 57600, 115200 Baud

- **ADDRESS**

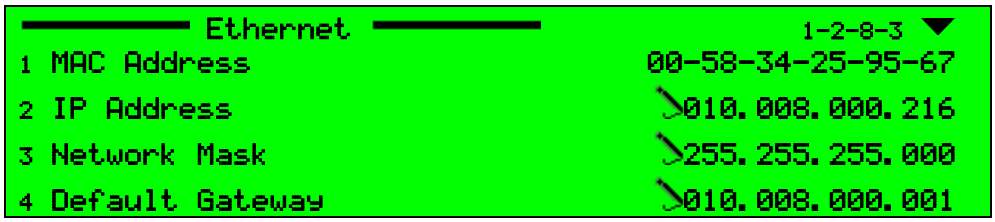


The available range is a hexadecimal number between 0 and FFFF.

3.3.8.3. Ethernet Management Port

The **Ethernet Management Port** Menu allows setting the Ethernet management port parameters.

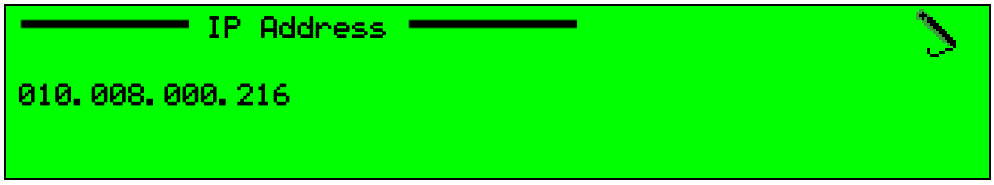
The Ethernet Management Menu is entered from the IRD Unit Configuration Menu (see Paragraph 3.3.8). The following figure displays the Ethernet Management menu:



The following paragraphs provide information about the **Ethernet Management Port Configuration** options.

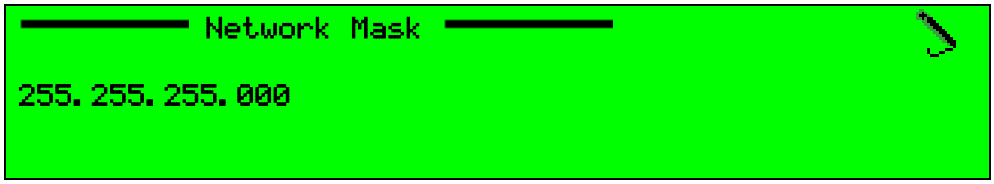
- **MAC ADDRESS**
  The **MAC Address** parameter displays the MAC address of the IRD management.

- **IP ADDRESS**
  The **IP Address** parameter displays and allows setting the currently active IP Address of the management port



  The value in each field must be a number between 0 and 255.

- **NETWORK MASK**
  The **Network Mask** parameter allows setting the network sub-mask.



  The value in each field must be a number between 0 and 255.

- **DEFAULT GATEWAY**
  The **Default Gateway** parameter allows setting the network default gateway address. This is the address of a local IP router on the same network as the IRD-2900, which is used to forward traffic beyond the local network.

  The value in each field must be a number between 0 and 255.

3.3.8.4. Licensing Menu

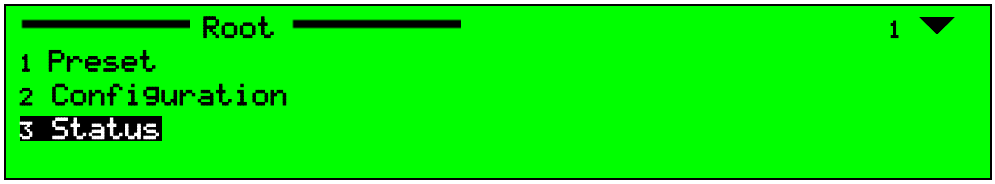
This feature will be supported in future software release.

3.4. IRD STATUS MENU

The **IRD Status Main Menu** in the IRD Menu Tree displays the status of the receiver and decoder in the IRD.

The IRD Status Main Menu is entered from the IRD Root Menu.

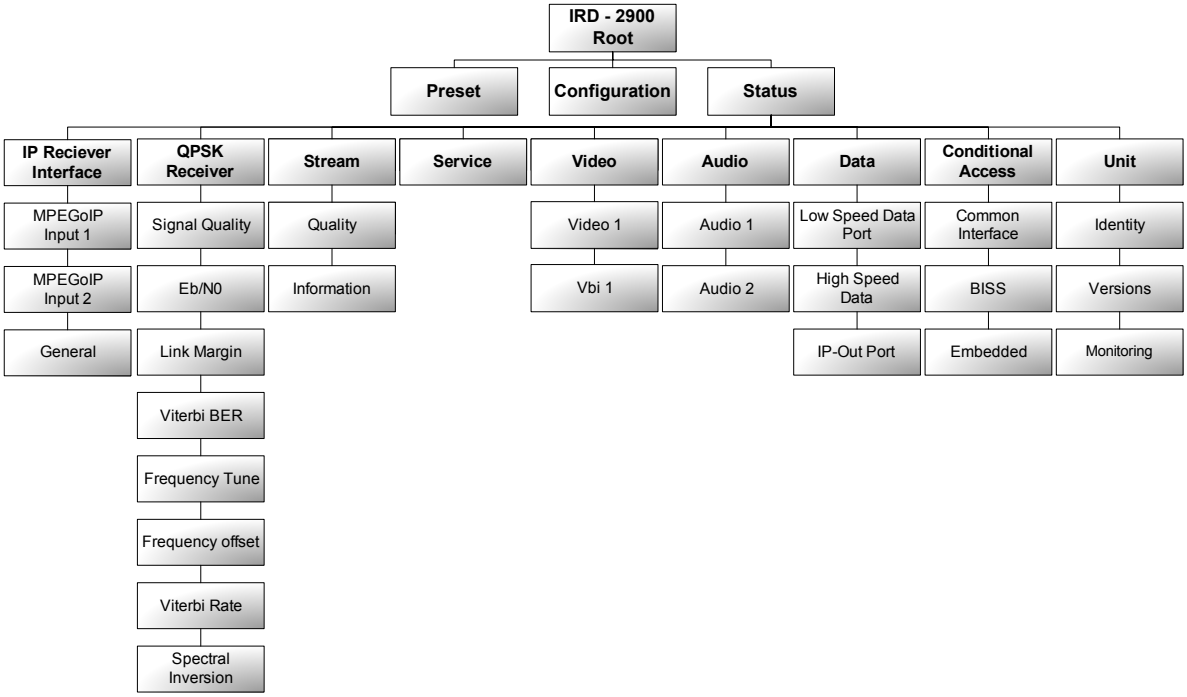
To select the IRD status main menu, select the "Status" option in the Root Menu (navigate vertically by using the **[Up]/[Down]** arrow keys and confirm selection by pressing **[Enter]**).



The IRD Status Menu is displayed in the following Menu Navigation screen (eight options):

Figure 3-7 illustrates the **IRD Status Menu Tree** structure and the available options:

Figure 3-7: Status Menu Tree



3.4.1. Receiver Status Menu

The **Receiver Status Menu** displays receiver information.

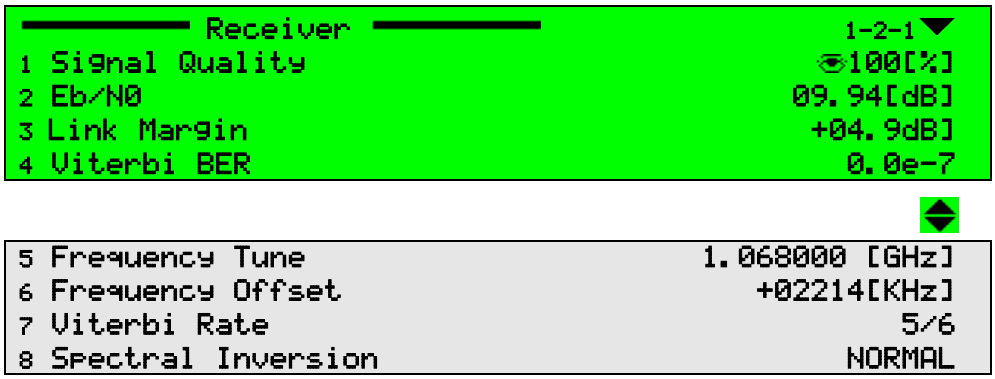
3.4.1.1. QPSK Receiver Status Menu

NOTE

*The Status Menu for the QPSK Front-End Receiver option is activated only when the **QPSK Front-End** is installed.*

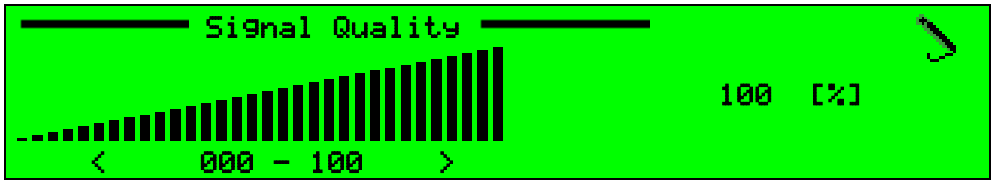
*The **LNB L.O. Frequency** parameter is activated when the Ku and C-Band is selected.*

The **QPSK Receiver Status Menu** is entered from the IRD Status Main Menu (see Paragraph 3.4) and is displayed in the following menu format:



The available options are:

- **Signal Quality** – Qualitative indicator of the received signal C/N relative to the maximum C/N that can be measured without forcing the receiver to saturation.



  The Available range is a percentage value between 0 and 100.
- **Eb/N0** – Received signal Eb/N0 measurement
- **Link Margin** – The estimated C/N of the received signal relative to the C/N in EN 300-421 for a given Viterbi rate
- **Viterbi BER** – Errored bits that the Viterbi error correction did not correct. BER is measured over 10^7 symbols.
- **Frequency Tune** – The value is dependent on the mode selected in **Root→ Configuration → Receiver → Freq Drift Compensate** (see Paragraph 3.3.1.1/7)
  When Frequency Drift Compensate is set to **On**, the value of the frequency tune displays the frequency of the incoming signal after frequency offset set-off.
  When Frequency drift Compensate is set to **Off**, the value of the frequency tune displays the actual frequency.

NOTE

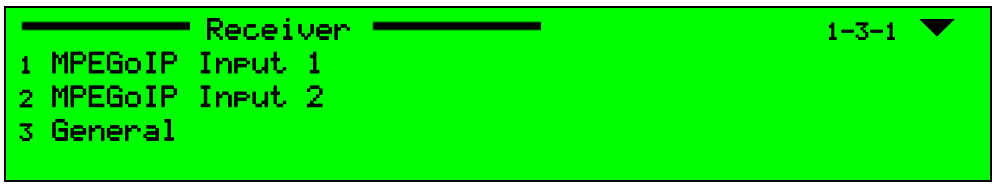
Displayed frequencies are L-Band frequencies.

- **Frequency Offset** - Displays the offset from the frequency as was set in **Configuration → Receiver → Frequency** (see Paragraph 3.3.1.1).
  When Frequency Drift Compensate is set to On, the frequency offset displays the value 0.
  When Frequency Drift Compensate is set to Off, frequency offset displays the value of the offset from the tuned frequency in KHz.
- **Viterbi Rate** – When Viterbi rate mode is set to automatic (see Paragraph 3.3.1.1), the value displayed is IRD selected. When Viterbi rate is manually configured to specific rate, the value displayed is user selected.
- **Spectral Inversion** – When the Spectral Inversion mode is set to automatic (see Paragraph 3.3.1.1), the value displayed is IRD selected. When you set the Spectral Inversion manually, the value displayed is user–made selected.

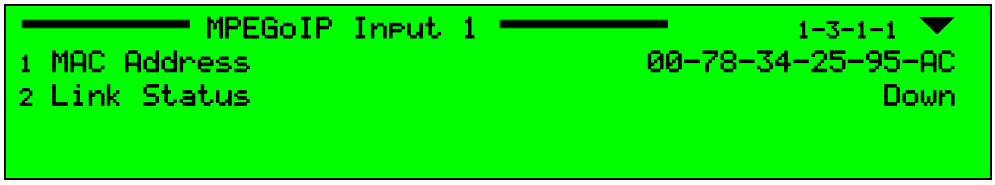
3.4.1.2. IP Receiver Status Menu

The **IP Receiver Status Menu** displays parameters that are used for connecting the IRD to the IP network for connecting to a required TS source.

The IP Receiver Status Menu is entered from the IRD Status Main Menu (see Paragraph 3.4) and is displayed in the following menu format:



MPEGoIP Input #

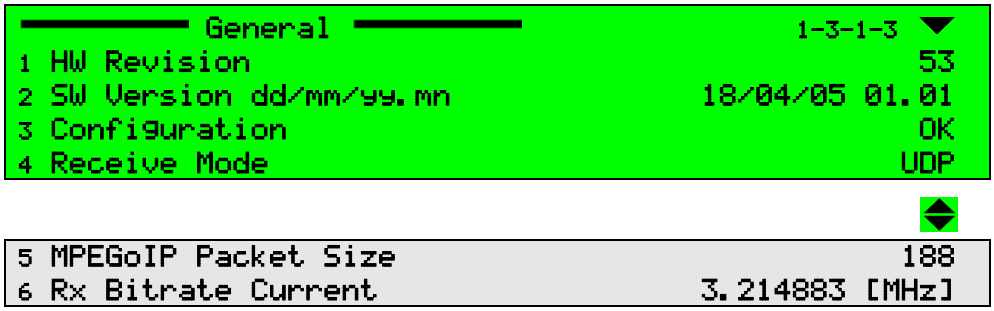


The **MPEGoIP Input Menu** parameters are categorized as follows:

- **MAC Address** – displays the MPEG over IP front-end MAC address.
- **Link Status** – displays the current link status
  The link status available parameters:
  - **Down** – Link down
  - **Up** – Link is up and connection established
  - **10 Base-T**, **100 Base-T** – IP Data Port Speed
  - **Full** – Full Duplex, IP Data Port Duplex
  - **Half** – Half Duplex. IP Data Port Duplex

The horizontal bars **[--]** appear when the IP Data Port link is "**Down**" or when the IP Data Port is disconnected.

GENERAL



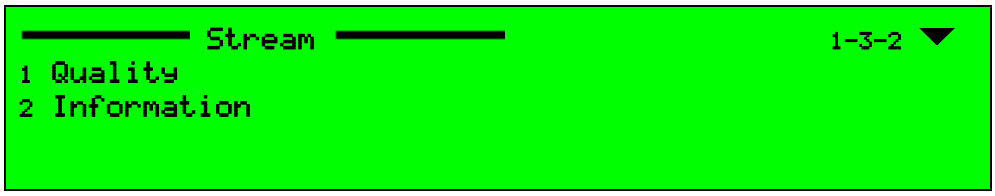
The **MPEGoIP Input Menu** parameters are categorized as follows:

- **HW Revisuion** – displays the hardware version
- **SW Version** – displays the software date and version number
- **Configuration** – displays the "OK" or "Mismatch" self test status result
- **Receive Mode** – displays the UDP or RTP protocol receive mode
- **MPEGoIP Packet Size** – displays the packet size in bytes
- **Rx Bitrate Current** – displays the calculated bit rate received un the input

3.4.2. Stream Status Menu

The **Stream Status Menu** provides an extended menu of status monitoring options on the input stream.

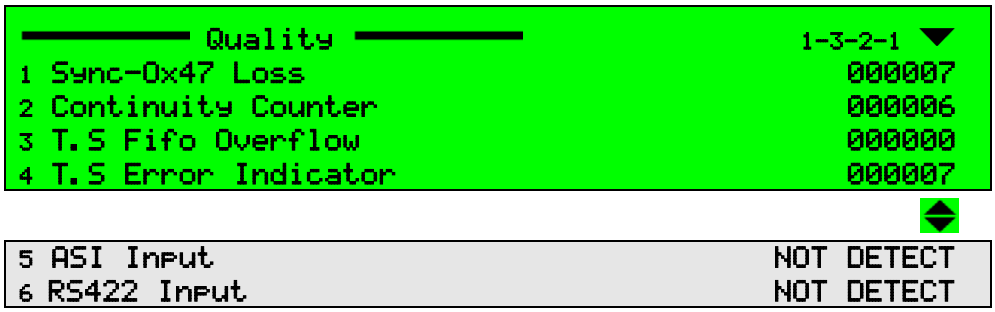
The Stream Status Menu is entered from the IRD Status Main Menu (see Paragraph 3.4) and is displayed in the following menu format:



3.4.2.1. Quality

The **Quality Menu** displays information about the quality of the Input Stream.

The Quality Menu is entered from the IRD Stream Status Menu (see Paragraph 3.4.2). The following figure displays the Quality menu:



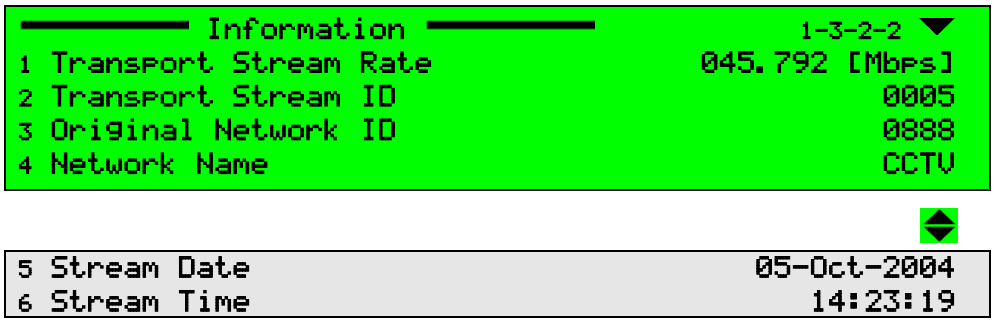
The Quality Menu parameters are categorized as follows:

- **Sync-0x47 Loss** – Counts the number of sync loss events
- **Continuity Counter** – Counts the number of a continuity of error events
- **TS FIFO overflow** – Count the number of FIFO buffer events
- **TS Error Indicator** – Counts the number of MPEG packets that were received by the IRD-2900 and had the TS error indicator bit set
- **RS422 Input** – Has three modes:
  -**NOT DETECTED** – No input
  -**188 DETECTED** – MPEG packets without FEC
  -**204 DETECTED** – MPEG packets with FEC

3.4.2.2. Information

The **Information Menu** displays information about the transport stream and network.

The Information Menu is entered from the IRD Stream Status Menu (see Paragraph 3.4.2). The following figure displays the Information menu:



The **Information Menu** parameters are categorized as follows:

- **Transport Stream Rate** –Displays the Transport Stream rate
- **Transport Stream ID** – Displays the identification code of the current transport stream ID in Hexadecimal values
- **Original Network ID** – Displays the identification code of the current network in Hexadecimal values
- **Network Name** – Displays the provider name of the current network
- **Stream Time** – Displays the time (HH:MM:SS) of the current incoming stream
- **Stream Date** – Displays the date (DD-MMMM-YYYY) of the current incoming stream

3.4.3. Service Status Menu

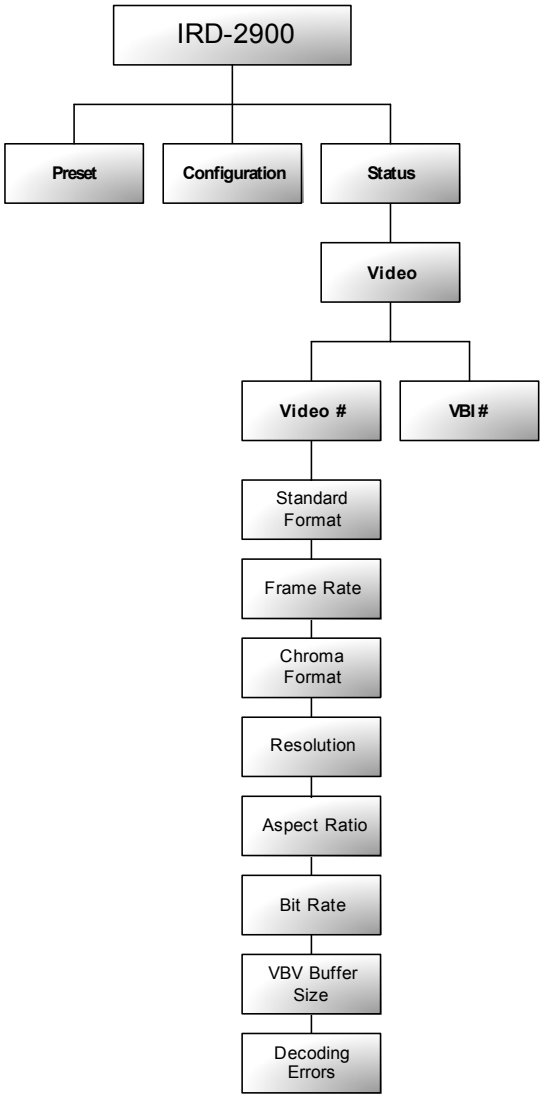
This feature will be supported in future software releases.

3.4.4. Video Status Menu

The **Video Status Menu** displays information about the Video and VBI parameters.

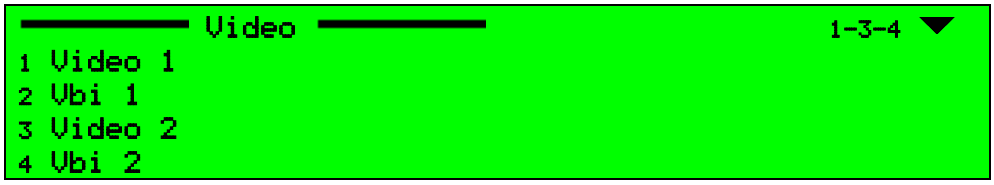
Figure 3-8 illustrates the IRD **Video Menu Tree** structure and the available options:

Figure 3-8: Video Menu Tree



The **Video Status Menu** provides an extended menu of status monitoring options on Video and VBI data.

The Video Status Menu is entered from the IRD Status Main Menu (see Paragraph 3.4) and is displayed in the following menu format:



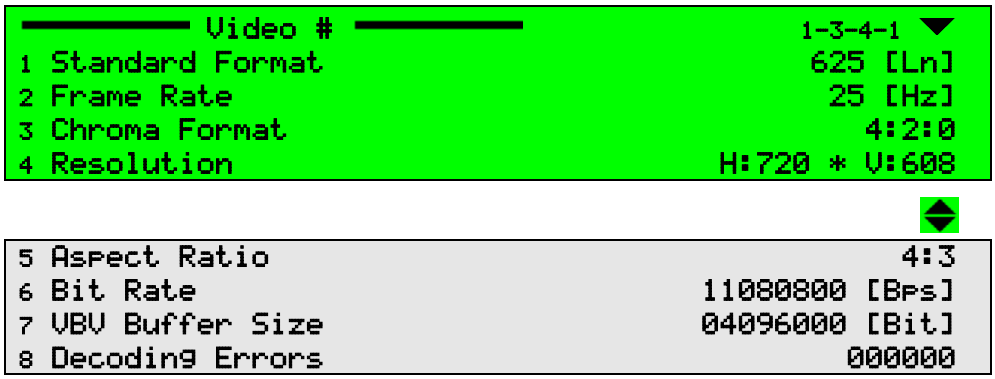
The **Video Status Menu** parameters are categorized as follows:

- **Video 1**
  This group displays information about the video for decoder #1.
  For details on the Video 1 Parameter, see Paragraph 3.3.4.
- **VBI 1**
  This group displays information about the VBI for decoder #1.
  For details on the VBI 1 Parameter, see Paragraph 3.3.4
- **Video 2** (if applicable)
  This group displays information about the video for decoder #2.
  For details on the Video 2 Parameter, see Paragraph 3.3.4.
- **VBI 2** (if applicable)
  This group displays information about the VBI for decoder #2.
  For details on the VBI 2 Parameter, see Paragraph 3.3.4.

3.4.4.1. Video 1 and Video 2

The **Video 1 and Video 2 Menu** displays information about the video format

The **Video 1 Menu** is entered from the IRD Video Status Menu (see Paragraph 3.4.4). The following figure displays the Video 1 and Video 2 menu:



NOTE

The 'Decoding Errors' parameter indicates the video stream health.

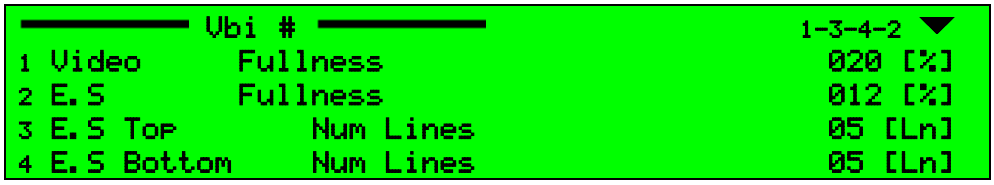
The available information is:

- **Standard Format** – Indicates the number of lines in the incoming video. In this example, 625 lines indicate PAL video format.
- **Frame Rate** – Displays the frame rate of the incoming video stream
- **Chroma Format** – Displays the Chroma format currently used for the incoming video stream
- **Resolution** – Displays the horizontal and vertical video resolutions for the incoming video stream (for example, the number of pixels per horizontal and vertical screen lines)
- **Aspect Ratio** – Displays the aspect ratio for the incoming video stream
- **Bit Rate** – Displays the bit rate, in bits/sec, for the incoming video stream
- **VBV Buffer Size** – Displays the VBV buffer size
- **Decoding Errors** – Displays the total number of decoding errors

3.4.4.2. VBI 1 and VBI 2

The **VBI 1 and VBI 2 Menu** displays information about the VBI.

The VBI 1 and VBI 2 Menu is entered from the IRD Video Status Menu (see Paragraph 3.4.4). The following figure displays the VBI 1 and VBI 2 menu:



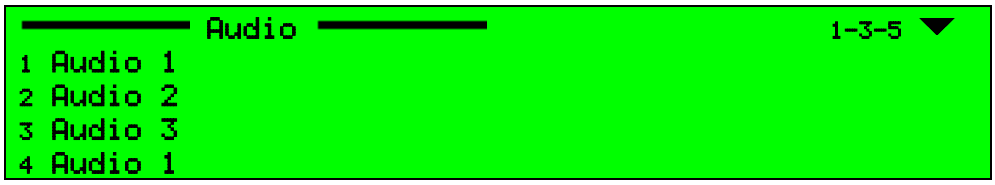
The available information is:

- **Video Fullness** – The fullness level of the buffer containing VBIs derived from the video stream
- **E.S Fullness** – The fullness of the buffer containing VBIs derived from the elementary stream
- **E.S Top Num Lines** – Counts the number of E.S VBI lines in a field
- **E.S Bottom Num Lines** – Counts the number of E.S VBI lines in a field

3.4.5. Audio Status Menu

The **Audio Status Menu** displays information on the audio channels.

The Audio Status Menu is entered from the IRD Status Main Menu (see Paragraph 3.4) and is displayed in the following menu format:

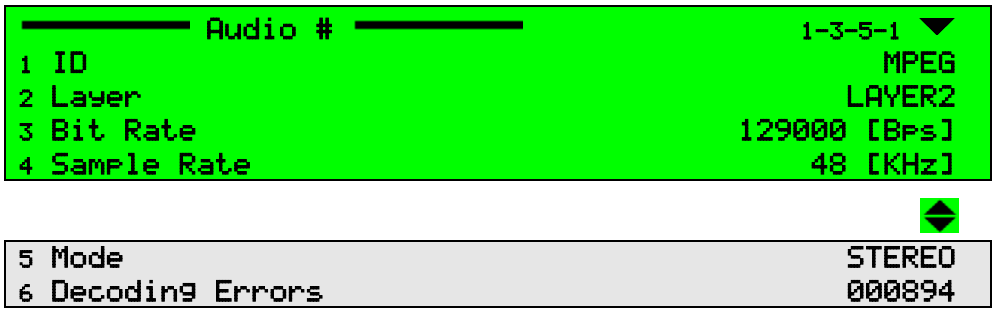


3.4.5.1. Audio

The **Audio Menu** displays information on the audio decoding process.

The Audio Menu is entered from the IRD Audio Status Menu (see Paragraph 3.4.5).

When Musicam mode is activated, the screen below is displayed:

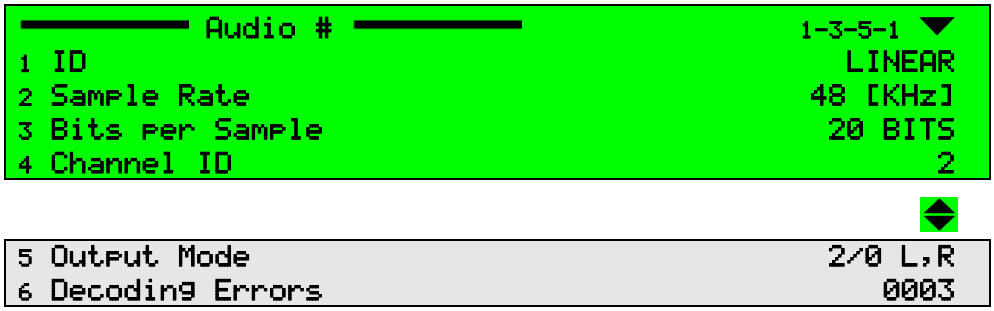


NOTE

*The '**Decoding Errors**' parameter indicates the video stream health.*

When Dolby-AC3 mode is activated, the screen below is displayed:

When Linear PCM mode is activated, the screen below is displayed:



NOTE

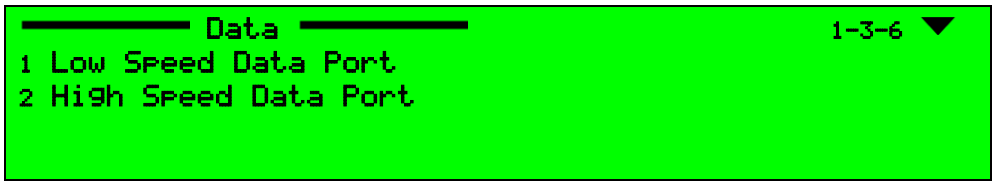
The Channel ID parameter value is according to the channel number of the AC3 header.

3.4.6. Data Status Menu

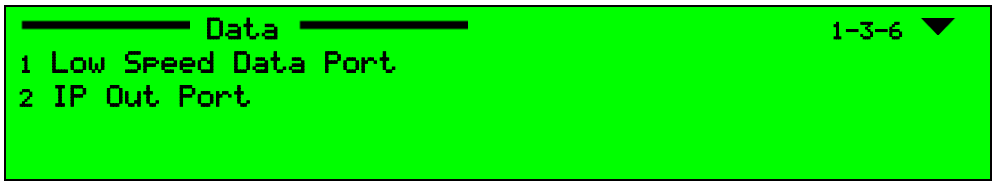
The **Data Status Menu** displays information about the data input stream.

The Data Status Menu is entered from the IRD Status Main Menu (see Paragraph 3.4).

High Speed Data Port is supported in IRD-2960 and IRD-2990 models. For these models, the Data Status menu is displayed as follows:



IP-Out-Port is supported in all IRD-2900 models, except for the IRD-2960 and IRD-2990 models. For these models, the Data Status menu is displayed as follows:



The Data Status menu parameters are categorized as follows:

- **Low Speed Data Port**
  See Paragraph 3.4.6.1.
- **High Speed Data Port**
  See Paragraph 3.4.6.2.
- **IP Out Port**
  See Paragraph 3.4.6.3.

3.4.6.1. Low Speed Data Port

This feature will be supported in future software release

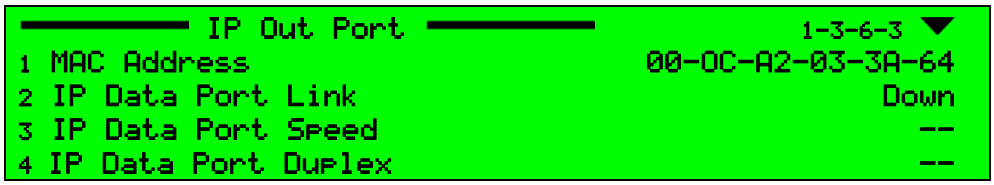
3.4.6.2. High Speed Data Port

This feature will be supported in future software release

3.4.6.3. IP-Out-Port Status Menu

The **IP-Out-Port Status Menu** provides IP and Port related parameter statuses.

The IP-Out-Port Status Menu is entered from the IRD Data Status Menu (see Paragraph 3.4.6). The following figure displays the IP-Out-Port menu:



The available options are:

- **MAC Address** – Displays the IP MAC address.
- **IP Data Port Link** – Displays the status of the IP out link.
  The link statuses:
  - **Down** – Link is down
  - **Up** – Link is up and connection established
- **IP Data Port Speed** – 10 Base-T, 100 Base-T
- **IP Data Port Duplex** –
  - **Full**: Full duplex
  - **Half**: Half duplex

The horizontal bars **[--]** are displayed when the IP Data Port link status is down or when the IP-Data Port is disconnected.

3.4.7. Conditional Access Status Menu

The **Conditional Access Status Menu** displays information about the Conditional Access parameters.

The Conditional Access Status Menu is entered from the IRD Status Main Menu (see Paragraph 3.4) and is displayed in the following format:

NOTE

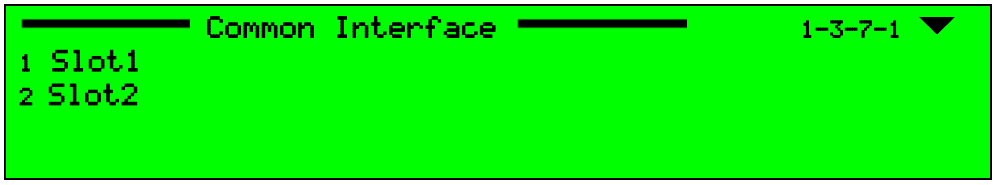
The Conditional Access Status menu is for qualified users only. You must be familiar with the DVB-C2 standard and the protocols.

- **COMMON INTERFACE**

The Common Interface Menu displays information on the CAMs inserted to the IRD CI Slot. The status menu for Slot 1 and Slot 2 is identical unless one of the CI Slots is not equipped with a CAM.

The Common Interface Menu is entered from the IRD Conditional Access Status menu.

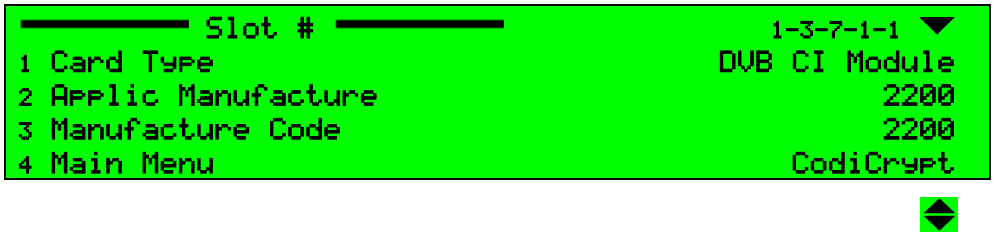
The following figure displays the **Common Interface** menu:



a. SLOT

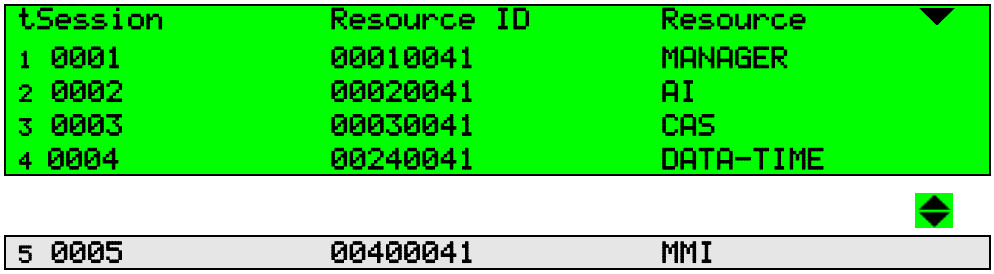
The **Slot # Menu** displays information on a CAM in Slot #.

The **Slot # Menu** is entered from the IRD Conditional Access Status Menu (see Paragraph 3.4.7). The following figure displays the Slot # menu:

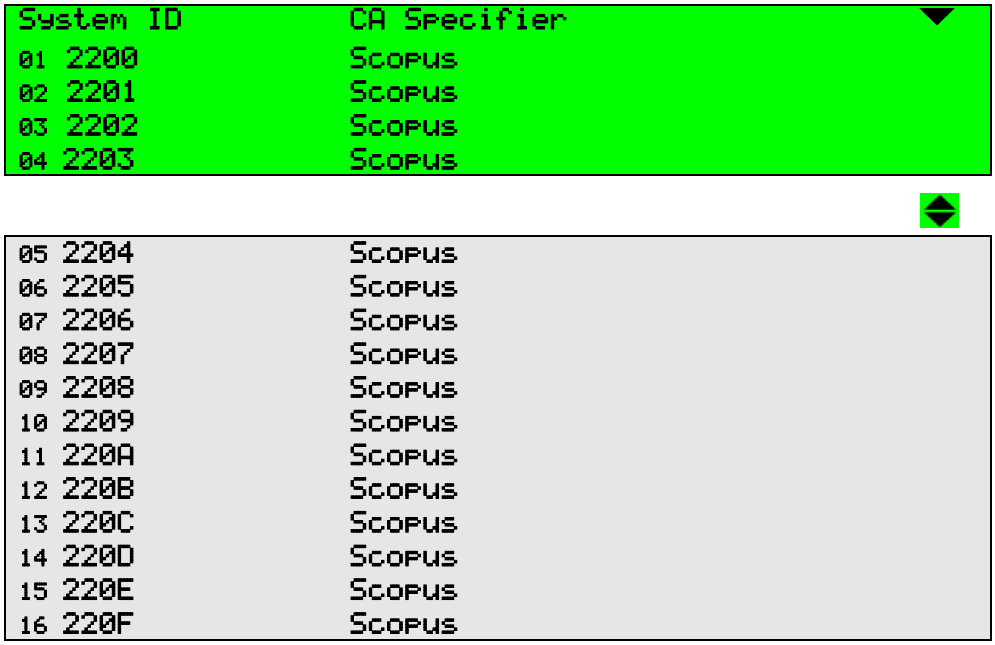


The available options are:

- **Card Type** – Displays card type
- **Applic Manufacture** – Displays application manufacturer value
- **Manufacture Code** – Displays the manufacturer code (defined by manufacturer).
- **Main Menu** – Displays CA vendor name
- **Available Sessions** – Displays currently available sessions.
  The following figure displays the Available Sessions Table screen:



- **Supported CA SysID:** Displays supported CA SysID.
  The following figure displays the Supported CA SysID Table screen:



NOTE

*To see Available Sessions and supported CA SysID values, select an item and press **[Enter]**.*

B. BISS

This feature will be supported in future software releases.

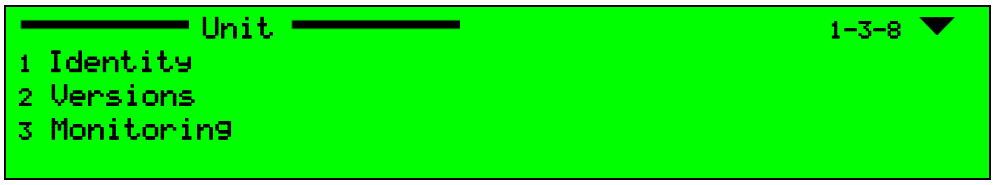
C. EMBEDDED

This feature will be supported in future software releases.

3.4.8. Unit Status Menu

The **Unit Status Menu** provides identity, version monitoring information, and statuses.

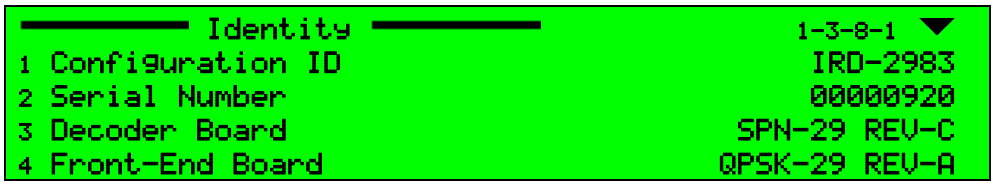
The **Unit Status Menu** is entered from the IRD Status Main Menu (see Paragraph 3.4) and is displayed in the following menu format:



3.4.8.1. Identity

The **Identity Menu** displays information on the IRD hardware.

The **Identity Menu** is entered from the IRD Unit Status Menu (see Paragraph 3.4.8). The following figure displays the Identity menu:



The available options are:

- **Configuration ID** – Displays the IRD software configuration model as recognized by the software. Note that the configuration ID may not be identical to the IRD model number as printed on the front panel.
- **Serial Number** – Displays the IRD serial number
- **Decoder Board** – Displays the hardware revision of the IRD main board
- **Front-End Board** – Displays the hardware revision of the IRD Front-End

3.4.8.2. Versions

The **Version Menu** displays information on the IRD software versions.

The **Identity Menu** is entered from the IRD Unit Status Menu (see Paragraph 3.4.8). The following figure displays the Versions menu:

The available options are:

- **Boot Application** – Displays the boot application software version
- **Main Application** – Displays the main application software version
- **Main Application Date** – Displays the date when the main application was created
- **Main Application Time** – Displays the time when the main application was created

3.4.8.3. Monitoring

The **Monitoring Menu** displays temperature and management port statuses.

The **Monitoring Menu** is entered from the IRD Unit Status Menu (see Paragraph 3.4.8). The following figure displays the Monitoring menu:

The available options are:

- **Temperature** – Displays the internal temperature of the IRD as measured by the temperature sensor
- **Management Port Link** – Displays the status of the Management Port link. Link statuses are:
  - **Down**: Link is down
  - **Up**: Link is up and connection established
- **Management Port Speed** – 10 Base-T, 100 Base-T
  Management Port Duplex:
  - **Full**: Full duplex
  - **Half**: Half duplex

The horizontal bars **[--]** are displayed when the Management Port link status is down or when the IP Data Port is disconnected.

Appendix A.
SOFTWARE DOWNLOAD

A.1 DOWNLOADING SOFTWARE USING FTP

A.1.1 INTRODUCTION

A.1.1.1 IRD SETUP IP

Configure the IRD-2900 IP Management Port according to local network specifications. The IRD IP Management is configured from the front-panel by accessing **Configuration→Unit→Ethernet Management Port**.

The IP Management must set the following parameters: IP Address, Network Mask, and Gateway.

A.1.1.2 PC FTP APPLICATION

There are many PC Software Applications that support FTP.

The software download procedure in this document is performed using the built-in MS Windows FTP utility.

NOTE

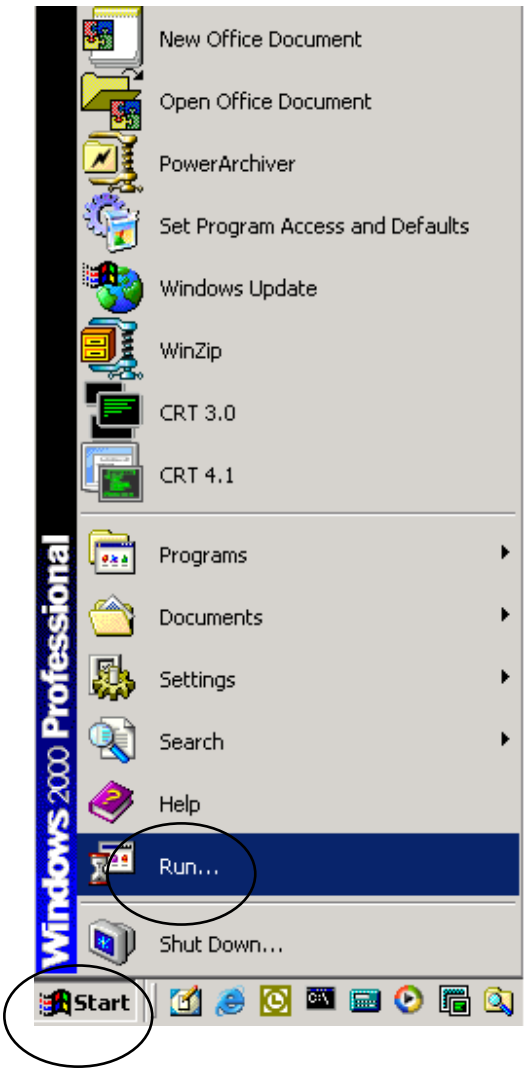
*The IRD version is entered from the front-panel **Status→Unit→Versions→Main Application**.*

A.1.2 INSTALLATION

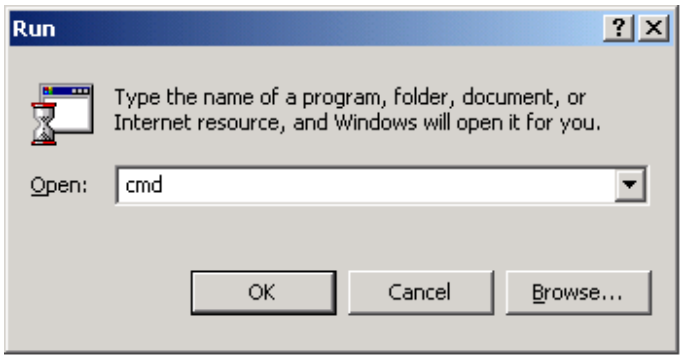
A.1.2.1 LOADING THROUGH FTP

To open an FTP session, perform the following:

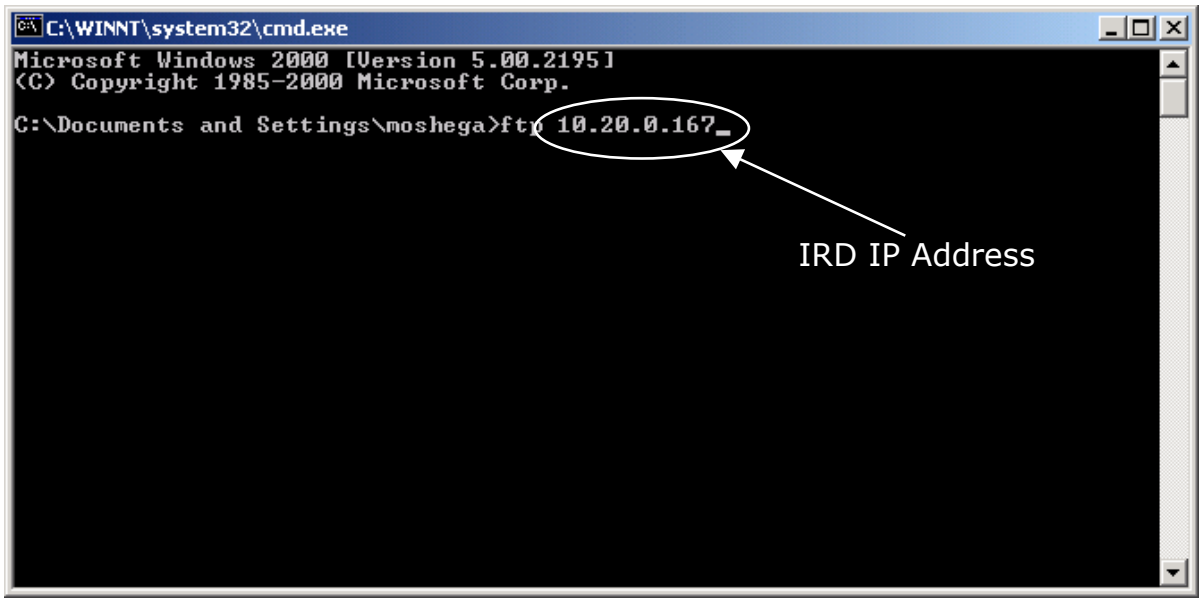
1. Click **Start**. The **Start Menu** is displayed.
2. From the **Start Menu** click **Run**. The **Run** dialog box is opened.



3. Type "cmd" in the combo-box and click **OK**. The Teminal window is opened.

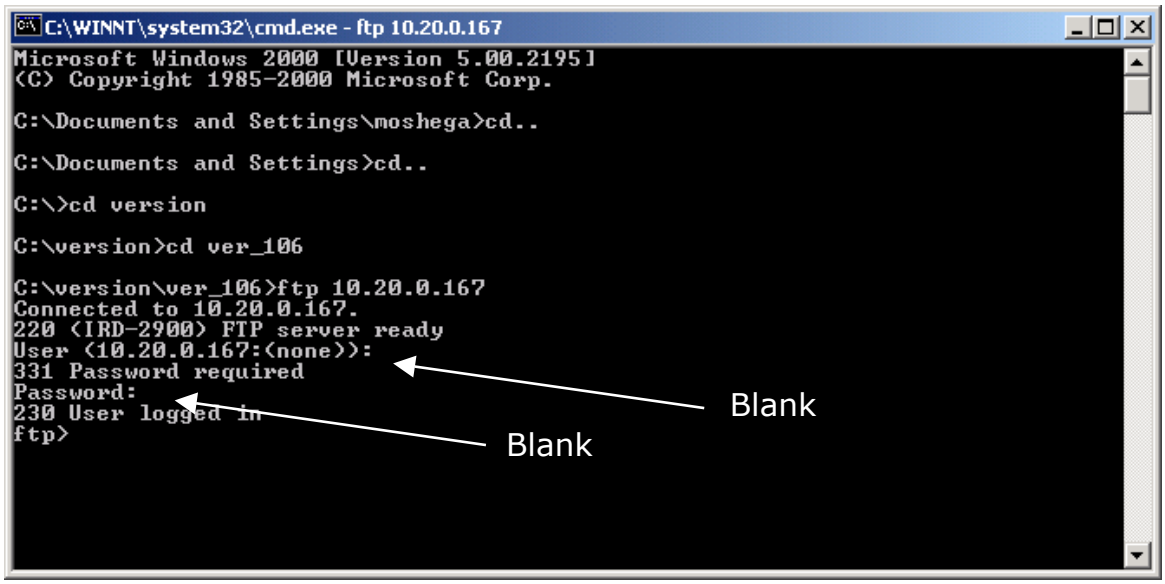


4. Type **"ftp <IRD Management IP address>"** and press **[Enter]**. FTP session is opened. See the example below.

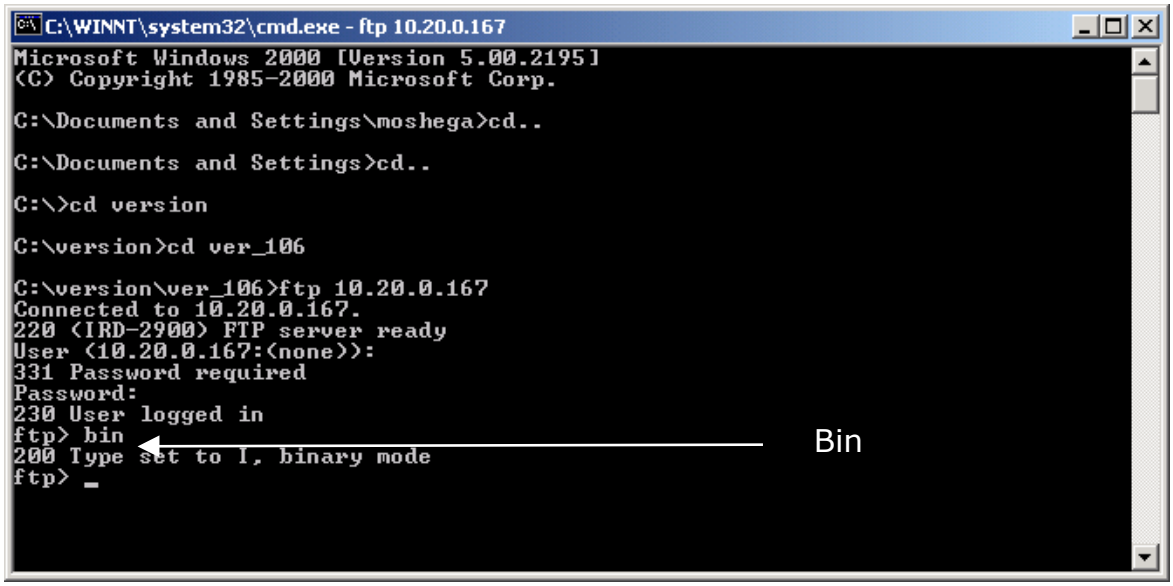


LOG ON

1. Log on to the IRD with the user name and password, both are empty for the IRD.
2. Reply with **[Enter]** for both user and password requests.



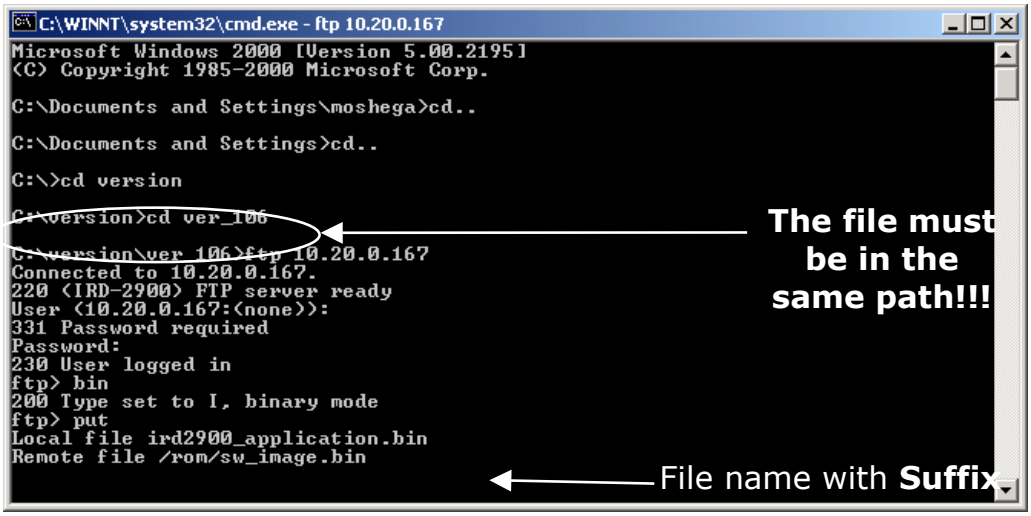
3. After connecting to the IRD through FTP, type "bin" and Click **[Enter]**.



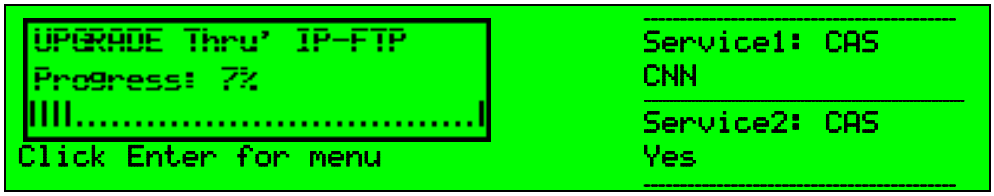
LOADING THE FILE

To load a source file to the IRD from a local PC:

1. Type **put** and Click **[Enter]**
2. After **Local File**, type the file name with the suffix (***Notice*** **-** the software file name and path in the PC should be known).
3. After **Remote File**, type **'/rom/sw_image.bin'**.



After confirmation, the IRD progress is displayed in a loading screen on the IRD front-panel. In the left frame window the loading progress is indicated by a percentage and a blinking progress bar. The following figure displays the IRD loading screen.



WARNING

IF THE IRD IS, FOR ANY REASON, SHUT DOWN DURING THE SOFTWARE DOWNLOAD, THE PROGRAM MUST BE REINSTALLED THROUGH BOOT SOFTWARE DOWNLOAD. REINSTALLATION IS AVAILABLE THROUGH RS-232. SEE PARAGRAPH A.2.2.2.

A.2 LOADING SOFTWARE TO THE IRD-2900 THROUGH THE SERIAL PORT

A.2.1.1 PC CONNECTION TO THE IRD-2900 SERIAL PORT

The IRD-2900 can be controlled from a standard PC through a serial RS-232 or RS-485 cable. Table 3-1 and Table 3-2 detail the pin-to-pin and signal assignments of the RS-232 and RS-485 cables, respectively.

Table 3-1: RS-232 Control Cable Pin-to-Pin

9 PIN D-TYPE CONNECTOR (PC)	9 PIN D-TYPE CONNECTOR (IRD)	SIGNAL DESCRIPTION
2	3	Pc-RxD
3	2	Pc-RxD
5	5	GND

Table 3-2: RS-485 Control Cable Pin-to-Pin Designations

PC RS-485 9 PIN D-TYPE CONNECTOR		IRD RS-485 9 PIN D-TYPE CONNECTOR	
PIN	DESIGNATIONS	PIN	DESIGNATIONS
1	RB	1	TX+
6	RA	6	TX-
8	TB	8	RX+
9	TA	0	RX-

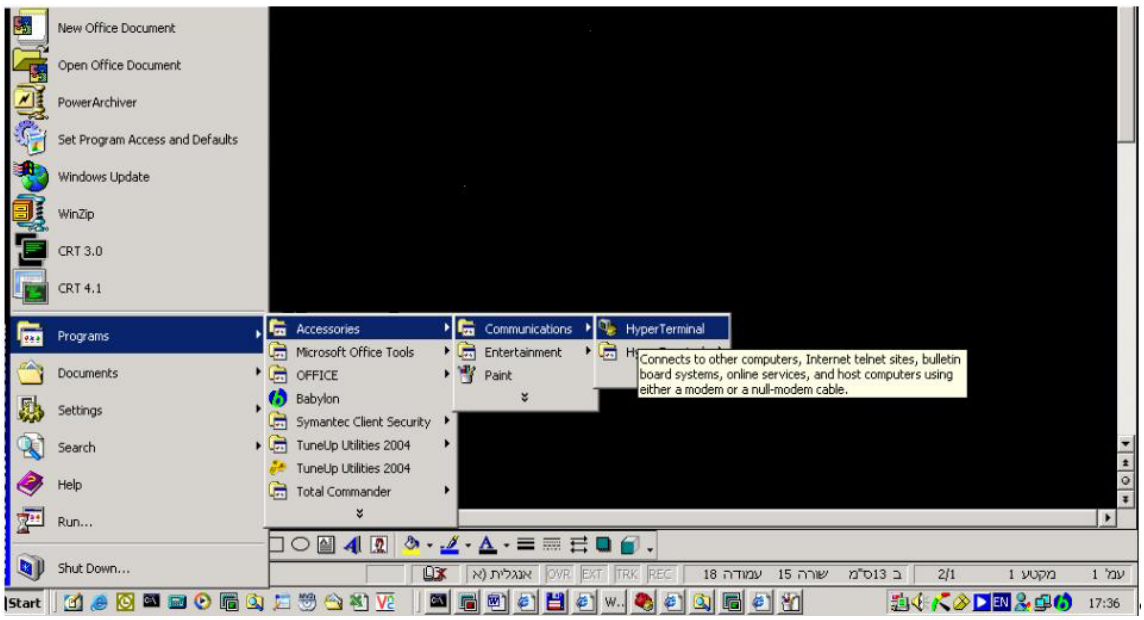
A.2.1.2 PC SERIAL-COM (TERMINAL) SOFTWARE

There are many Terminal Applications that support Serial-COM.

The software download procedure in this document is performed on the built-in MS Windows hyperterminal.

A.2.1.3 OPENING HYPERTERMINAL FROM MS WINDOWS

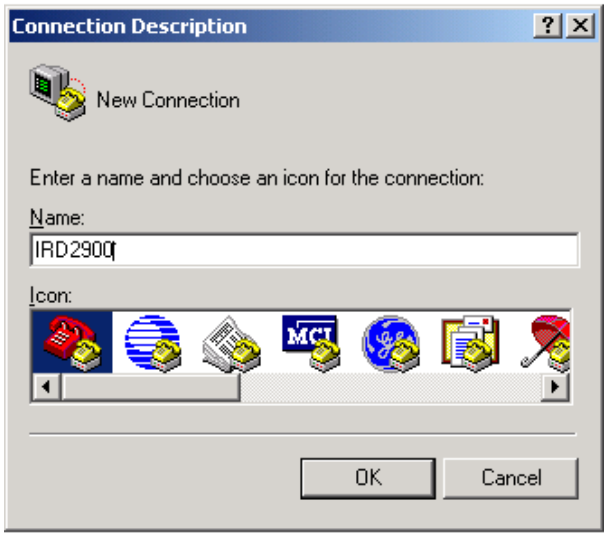
1. To access the HyperTerminal application, by selecting **Start→Program→Accessories→Communication→HyperTerminal**



A.2.1.4 DEFINING THE COMMUNICATION

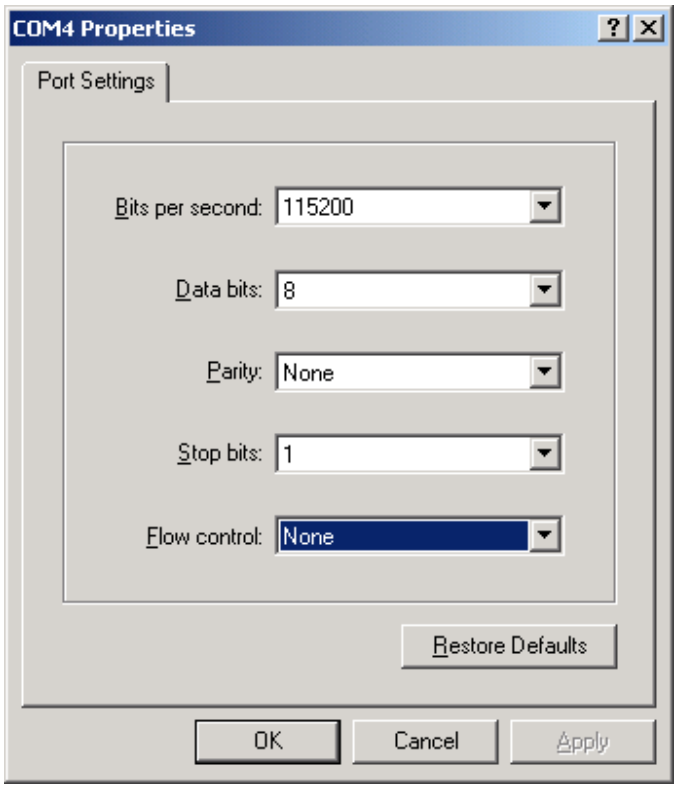
When the HyperTerminal starts the window below is displayed, which defines the communication:

1. Type the name of the connection, for example IRD2900. Click **OK**.



2. Select a PC COM port that is the specific PC COM to which the IRD is connected.

3. Select the Baud Rate this must be identical to the IRD-2900 baud rate parameter. See **Configuration→Unit→Serial Control Port→Baud Rate**.
4. Select **Flow Control – None**.

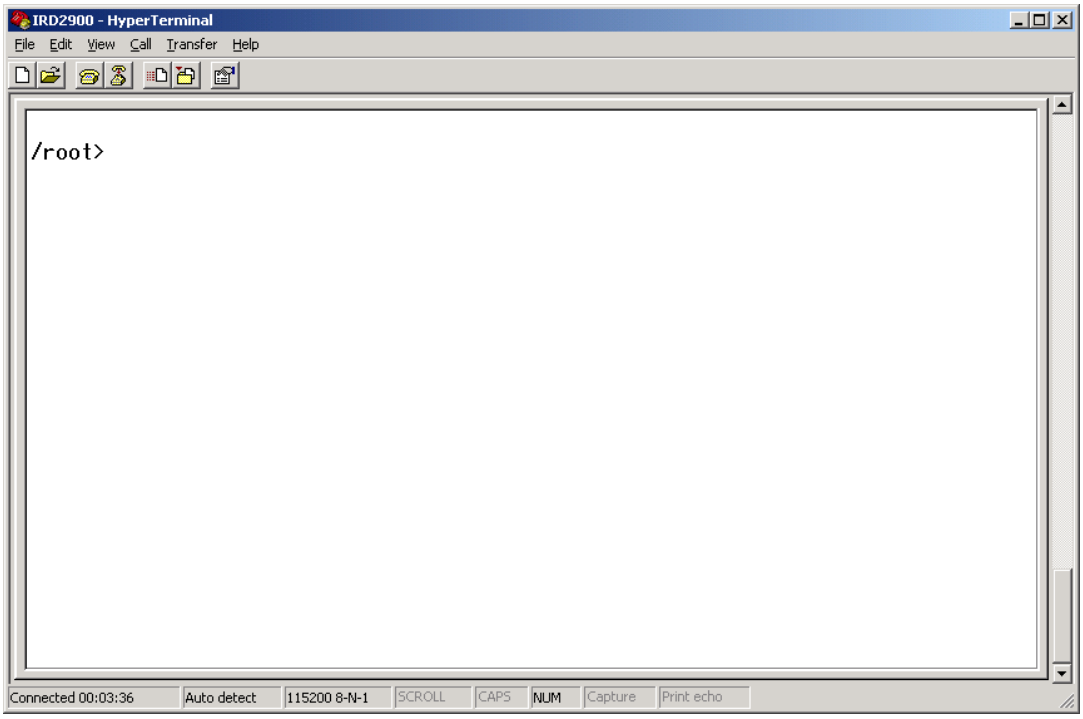


A.2.1.5 CHECKING PC TERMINAL COMMUNICATION WITH THE IRD

After setting the PC - hyperTerminal, the Terminal is opened and you can check the connection to the IRD.

Press **[Enter].** If you see the word **"Root"** on the terminal windiw, you have a connection with the IRD. **/root>** indicates the main path to the IRD.

You can also type **"help"** to see the IRD help commands.

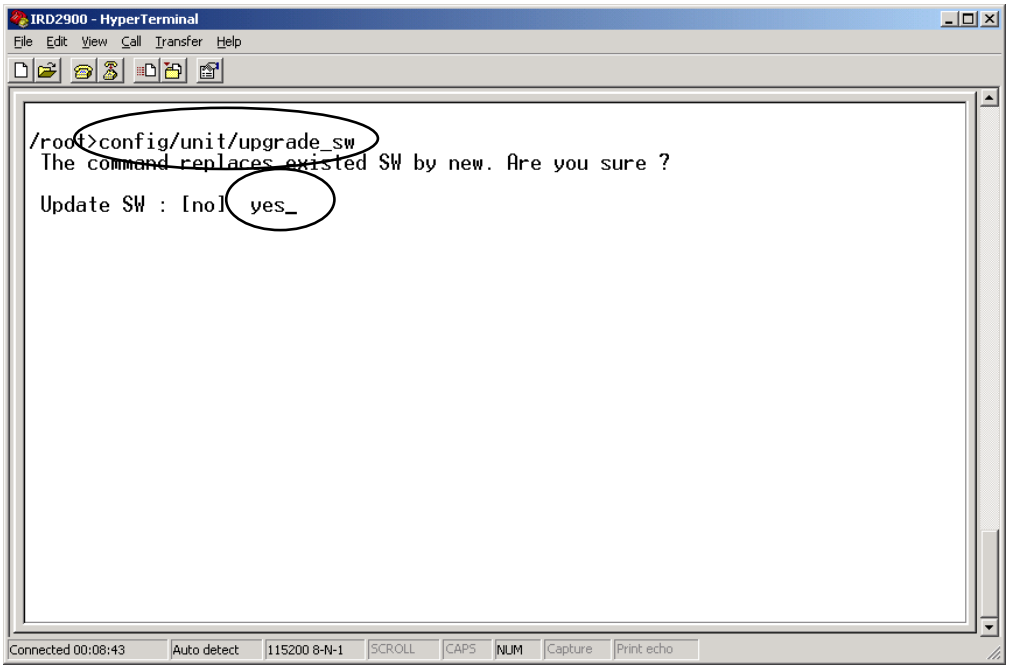


You can check the current IRD version with command **"status/unit/sw_info"** or follow the **Status→Unit→Versions→Main Application** path in the front panel (see Paragraph 3.4.8.2).

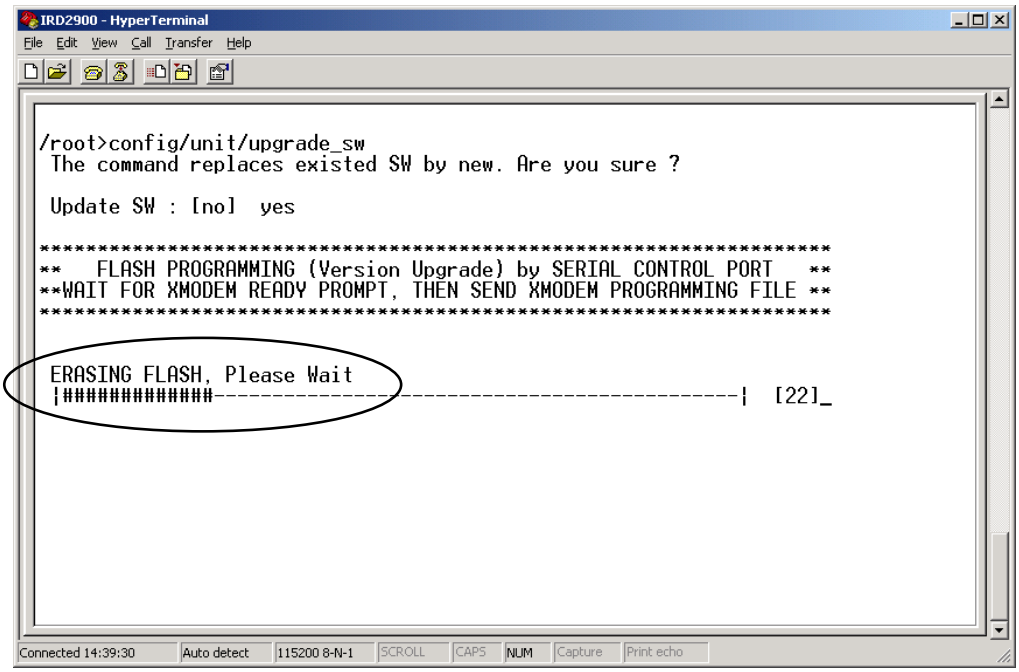
A.2.2 INSTALLATION:

A.2.2.1 LOADING NEW SOFTWARE SEQUENCE

1. After the PC-to-IRD Communication is checked, in the Root directory type command **"config/unit/upgrade_sw"** and confirm the message by typing **"yes"**.

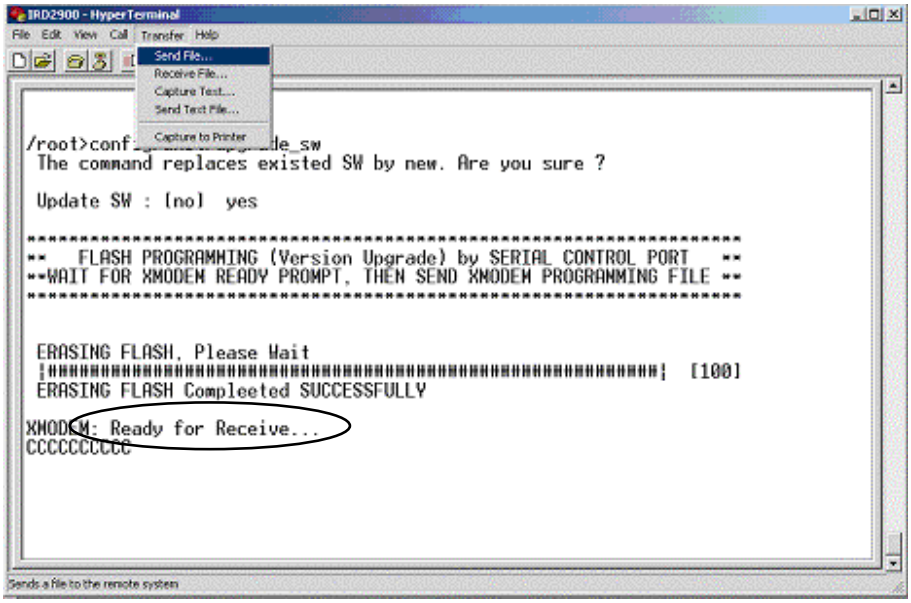


The IRD erases the previous software version when updating. This process can take approximately 30 seconds (see example).



After the previous software is erased, message **"Ready For Receive"** is displayed.

2. In the HyperTerminal, select **Transfer→send file**.

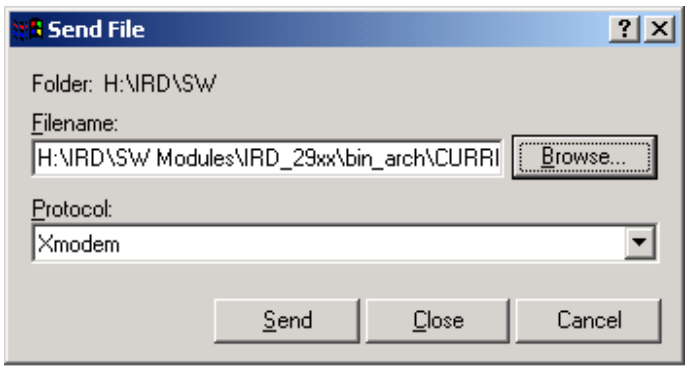

IRD2900 - HyperTerminal
File Edit View Call Transfer Help
Send File...
Receive File...
Capture Text...
Send Text File...
Capture to Printer
/root>conf
de_sw
The command replaces existed SW by new. Are you sure ?
Update SW : [no] yes
FLASH PROGRAMMING (Version Upgrade) by SERIAL CONTROL PORT
WAIT FOR XMODEM READY PROMPT, THEN SEND XMODEM PROGRAMMING FILE
ERASING FLASH, Please Wait
[100]
ERASING FLASH Completed SUCCESSFULLY
XMODEM: Ready for Receive...
CCCCCCCCC
Sends a file to the remote system

3. Specify to which used protocol to send the software file. It can be **"Xmodem"** or **"1K Xmodem"** protocol.

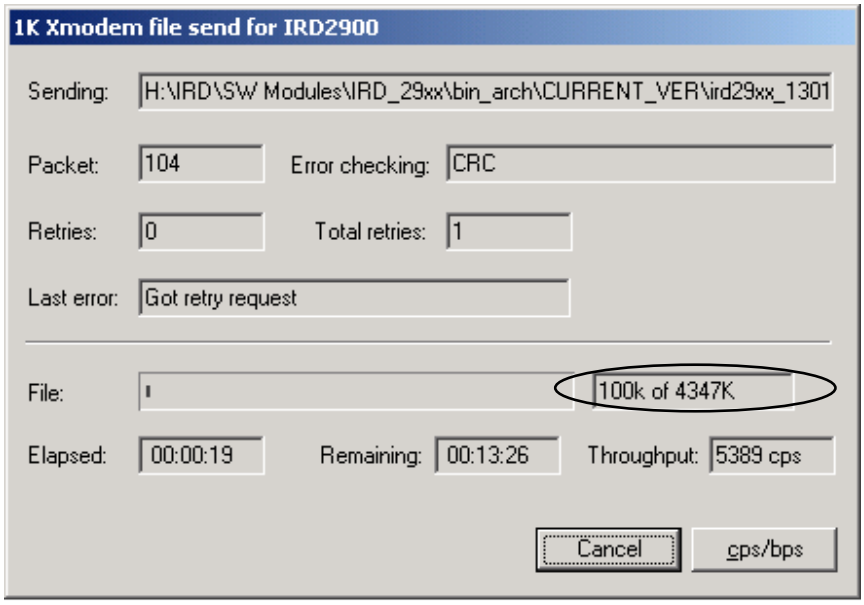
NOTE

"1K Xmodem" is faster than the "XModem".

4. Specify the path of the software file in your PC, for example:



5. Click **Send**. The loading starts. This may take a few minutes.
   The status is displayed in the window below or over the IRD front panel main menu.



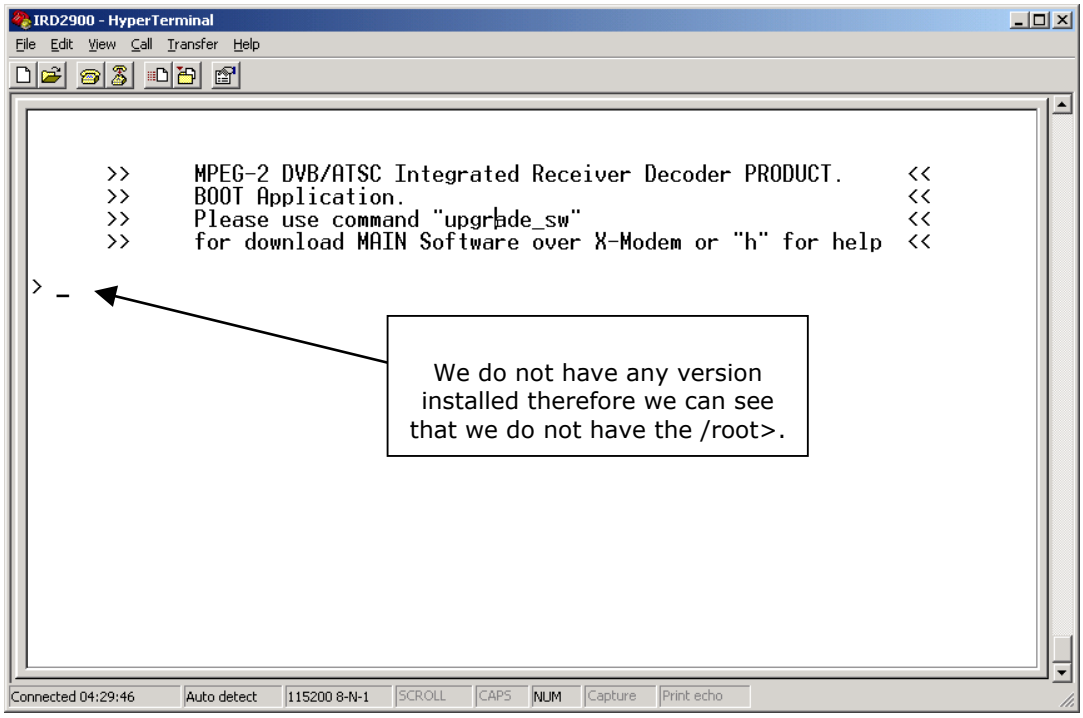
   When the process is complete, a confirmation is display, indicating that the file was loaded. Then the IRD performs reboot.

6. Wait until the IRD is finished rebooting with the new software.
7. On the front panel or serial check that the new version is installed.

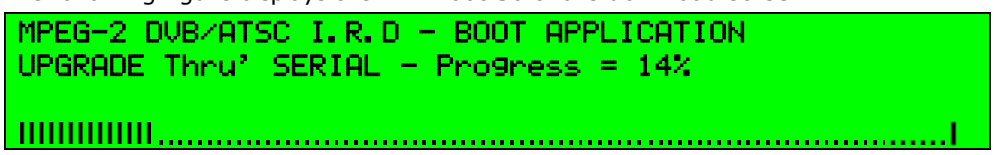
A.2.2.2 LOADING SOFTWARE VERSION THRU IRD BOOT APPLICATION

When the IRD is shut down during software download, the IRD startup sequence is set with the boot application. Perform the following:

1. Stop the previous Hyper Terminal sending process and restart standard communication with the IRD.
2. When the IRD starts the BOOT application, the following hyperterminal window is displayed.


IRD2900 - HyperTerminal
File Edit View Call Transfer Help
>> MPEG-2 DVB/ATSC Integrated Receiver Decoder PRODUCT. <<
>> BOOT Application. <<
>> Please use command "upgrade_sw" <<
>> for download MAIN Software over X-Modem or "h" for help <<
> _
We do not have any version installed therefore we can see that we do not have the /root>.
Connected 04:29:46
Auto detect
115200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

The following figure displays the IRD Boot Software download screen:



After download is complete, the IRD restarts standard operation with the new software version.

3. To use the Boot Application, type **"upgrade_sw applic".** The IRD starts to erase and after few minutes the **"Ready for Receive..."** message is displayed. Continue loading the new version according to the standard procedure.